JUN 16 1913

Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Telephone Weekly, Telephone Magazine, Telephone Securities, The Telephone and Sound Waves
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

VOL. 64, NO. 24
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BUYERS REFERENCE INDEX PAGE 61

CHICAGO, JUNE 14, 1913

SINGLE COPIES, 10 CENTS
YEARLY, U. S. A., $3; CANADA, $4;
ALL OTHER COUNTRIES, $5

The quality of our telephones and the faith we have in them

enables us to issue a free trouble insurance policy legally binding us to pay for all trouble expense they incur.

CHICAGO TELEPHONES SATISFY

Chicago Telephone Supply Company
ELKHART, INDIANA

'INSULATE'

Endorsed by Leading Manufacturers and Engineers as THE BEST for finish—strength—quality.

Switchboard Terminals
Receiver Cases
Handles
Mouthpieces
Insulations for
NUMEROUS ELECTRICAL PURPOSES

Specials of every kind made to order

Facilities Unsurpassed
Deliveries Prompt

GENERAL INSULATE COMPANY
1007-15 Atlantic Ave. BROOKLYN, N. Y.

Agents: R. S. Mueller, 423 High Ave., Cleveland, O.
A. J. Cox Co., 28 S. Jefferson St., Chicago, Ill.

MILLIONS Of Dry Cells Are Handled In This Territory

FRENCH Telephone Cells

Are Manufactured and Shipped
Direct from Madison, Wis.

There is no reason why the dry cells *you* use should get old in transportation and stock rooms before you install them.

Your orders will be shipped the day received.

Send for new price schedule.

FRENCH BATTERY & CARBON CO.
Madison, Wis.

10 times quicker
10 times safer
10 times a better wire skinning job by the use of

GOODRICH
WIRE-SKINNING PLIERS

than by the old jack-knife method.

These pliers eliminate all the troublesome features of stripping the insulation from the conductor.

It is a tool found in the equipment of all practical linemen.

Ask for a pocket catalog of Klein's tools.

Mathias Klein & Sons,
Station U34, Chicago, Ill.

Used in Every Country in the World

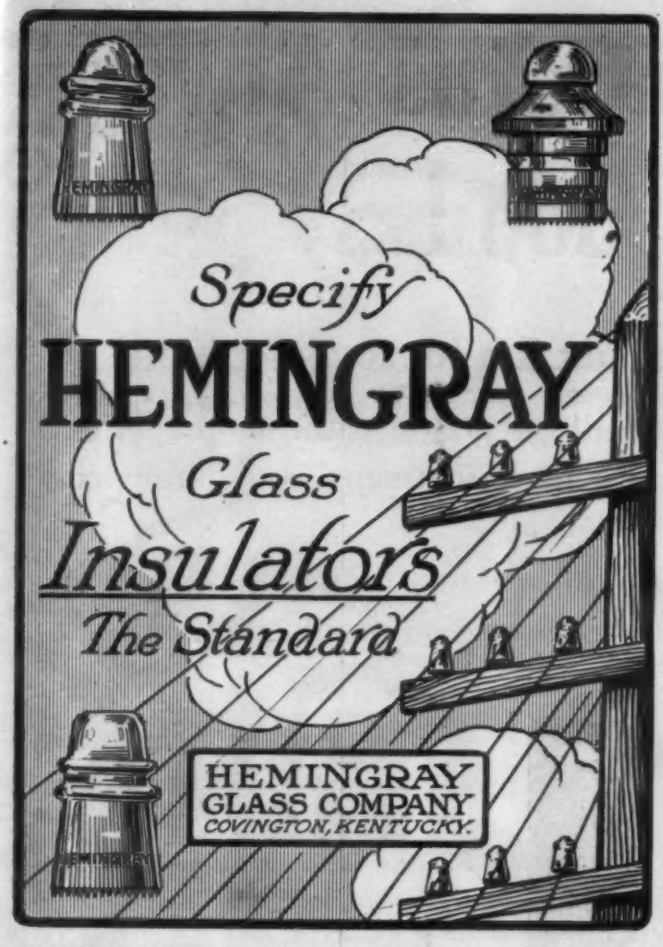
THE CALCULAGRAPH

Because it records elapsed time and because of its great accuracy and durability.

Machines in continuous use for sixteen years are still giving good service.

The Calculagraph is now the standard apparatus for recording the time consumed in the use of toll circuits in every country in the world where there are telephone toll lines.

CALCULAGRAPH COMPANY
1416 Jewelers Building NEW YORK CITY



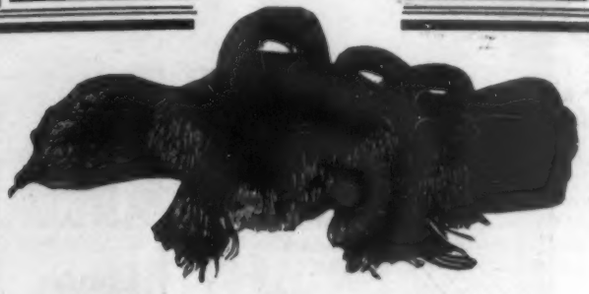
To meet adequately the most severe operating conditions

Belden Telephone Cords

are specially made. We make a cord or wire for every particular purpose—for each industry requiring individual wire or cords. Our operating facilities enable us to turn out a superior product at a very low price. It will pay you to investigate—***free samples sent on request.***

BELDEN MFG. CO.

2302 South Western Avenue, CHICAGO



Cord Expense Too High?

Wear and tear telling too heavily on your cordage? Not getting the service you should from the cord you now are using? Then write for *free samples* of

Runzel-Lenz Cords

Try them out—and you'll find as others have—that Runzel-Lenz Cords are the logical choice in cordage.

It's in the making—the knowing how—coupled with the highest quality raw material that makes Runzel-Lenz Cords *wear better—last longer.*

"They put the age in cordage."

Runzel-Lenz Electric Mfg. Company

1751-1753 N. Western Ave. **Chicago, Illinois**

Please tell the Advertiser you saw his Announcement in TELEPHONY.

"American" Apparatus Always Makes Good

No. 360 Samson Magneto Telephone

We have compressed all the goodness of long experience and constant effort into an instrument your knowledge tells you is best.

Thousands of these phones giving money-making service in hundreds of exchanges prove you should use them.

Note absence of wiring inside of cabinet. No wiring on back either

The generator, switchhook, induction coil and the receiver binding posts are all mounted on one shelf! Hence the wiring is needed only on this shelf. It couldn't be made any simpler or more workmanlike, and this shelf is removable! A most effective way to build a telephone. The switchhook lever is removable! No wires to disconnect from any piece of apparatus to get at another piece! Any one piece is entirely removable without disturbing the wiring leading or connecting to any other piece!

Features of Accessibility

To get at any of the parts of this telephone—the lightning arrester, ringer, transmitter and receiver are accessible, and the generator, switchhook, induction coil and receiver binding posts are all on one *removable* shelf, thus instantly accessible. To remove this shelf and bring all of these parts out for inspection, remove the switchhook lever, unscrew two large screws, and the shelf slides right out.

Lightning Arresters with Double Carbon Surfaces

Self cleaning. Two long parallel carbon cylinders. One metallic ground plate covers but does not touch the carbons. Easily removed. Good insulation prevent carbons from touching the ground plate.

Write for prices to our Special Distributors or direct to us

Wherever you are, there is a nearby stock for you.

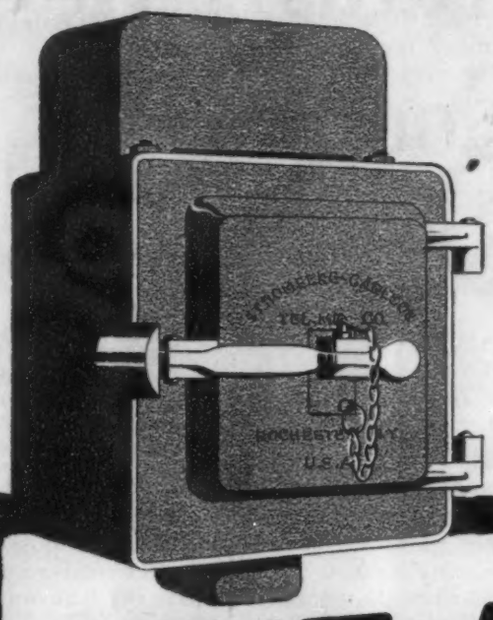
Wherever you have been buying, for your own good, write to nearest depot.

American Electric Company

MANUFACTURER

STATE AND 64th STREETS, (Englewood Station) CHICAGO, ILL.

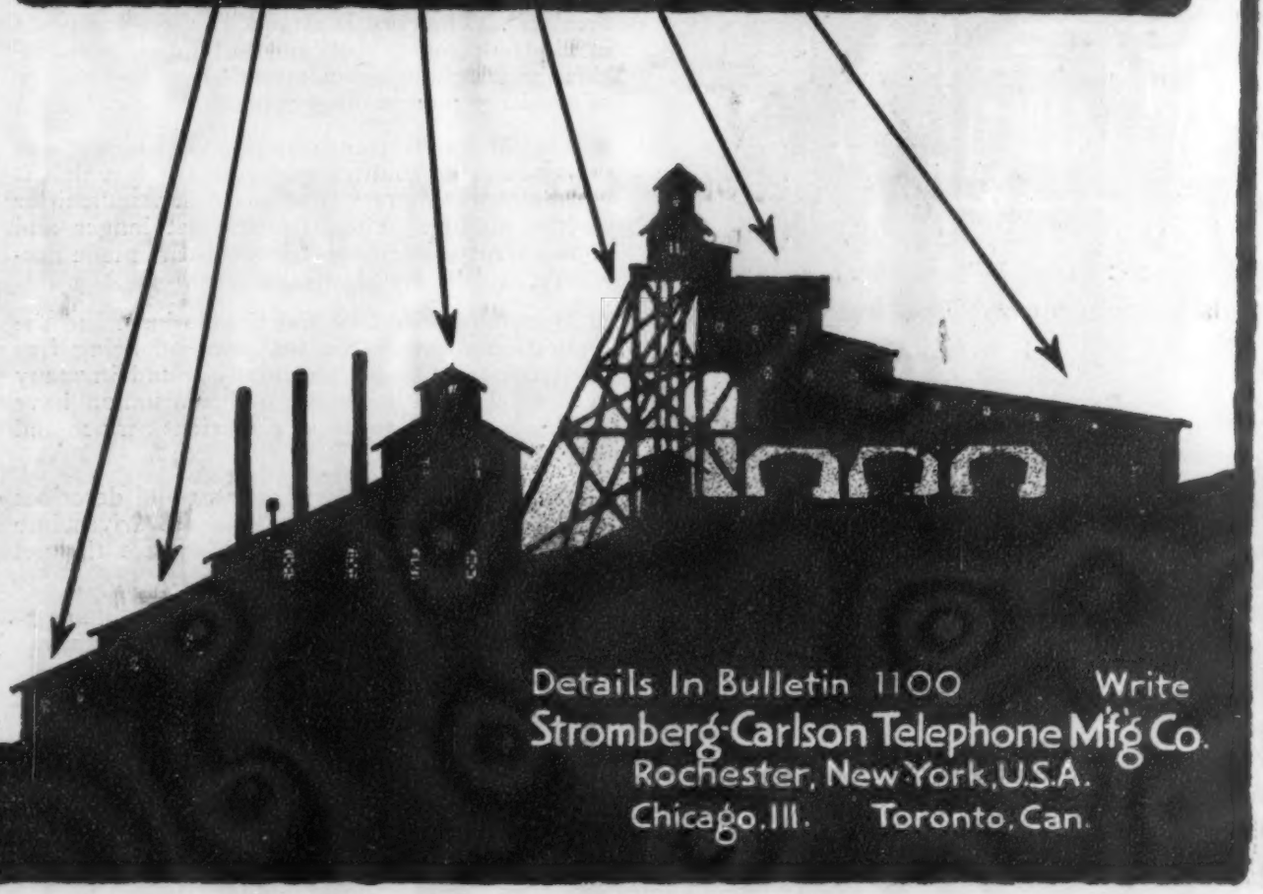
Please tell the Advertiser you saw his Announcement in TELEPHONY.



Fire and Damp-proof
Shock and Fool-proof
Sparkless--

MINE-A-PHONE

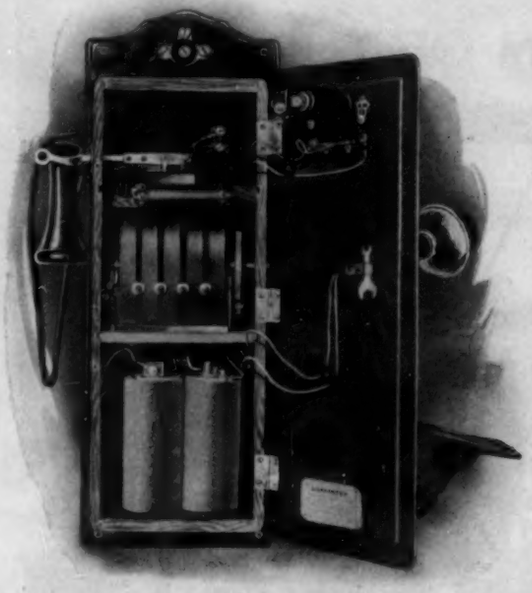
THE NERVOUS SYSTEM OF THE MINE



Details In Bulletin 1100 Write
Stromberg-Carlson Telephone Mfg Co.
Rochester, New York, U.S.A.
Chicago, Ill. Toronto, Can.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Save That Drive



¶ The cost of one drive into the country frequently equals three months' rental charge on the instrument repaired. Save such a drive once a week, or even once a month, and your profits are increased.

¶ In building Monarch telephones we endeavor to provide against the troubles which make these country drives necessary. Line trouble we cannot obviate or correct, but instrument trouble we can and do reduce to a minimum.

¶ Undoubtedly a study of trouble reports in magneto systems will show that little defects cause the biggest expense. Such things as poorly soldered joints, broken connections at the hinges, broken receiver cords, worn out batteries, defects in generators, etc., are the common troubles which cause the drives into the country.

¶ There are few soldered connections in Monarch telephones because the wiring between the different parts is carried just as far as possible without any breaks. The transmitter cords extend directly from the terminals inside the transmitter to the battery and to the induction coil. These cords are rubber insulated lamp cords, flexible and durable. The connections at the ringer mounted on the door are carried into the cabinet in flexible cords of the same construction. The wiring on the back of the cabinet is plainly visible and set back in a recess so as not to be damaged by contact with a wall or other surface.

¶ The receiver cord used in Monarch telephones is the best that can be produced. It has a strain cord at each end, thus saving the conductors from breaking. The cord is attached to binding posts inside the receiver shell and to binding posts inside the telephone cabinet, so there is less chance of breakage than in other types.

¶ The Monarch transmitter saves money and drives into the country owing to the fact that it consumes less battery than any other transmitter on the market. The batteries last longer and consequently fewer country drives are made necessary.

¶ Monarch generators and ringers have had the reputation for the past ten years of being free from the troubles so frequently found in many makes. The little details of construction have been worked out to provide efficient service and long life.

¶ Bulletin No. 24 fully illustrates and describes Monarch telephones which save the drives into the country and consequently increase the net profits. Write for a copy today.

Monarch Telephone Mfg. Co.
FORT DODGE, IOWA
U.S.A.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Start the Plant Right with COMPACTS

Code No. 896 Type
Dry Battery Series and Bridging

THIS standard Compact Wall Telephone is the standard for all Local Battery systems. It has many useful features all others lack and is known the world over for its superior quality and efficiency. For dependable service under the most trying conditions you need a No. 896 Type Telephone. Avoid any substitute and make a test or a comparison with this instrument before purchasing any Magneto Telephones. You should read our new Pamphlet No. 42 now.

Specify Code Numbers When Ordering

		One Telephone	Ten or More
896I Bridging	5 Bar — 1600 ohm	$10.35	$10.10
896A Series	3 Bar — 100 ohm	8.50	8.25
896B Series	4 Bar — 100 ohm	8.75	8.50
896C Bridging	3 Bar — 500 ohm	8.75	8.50
896D Bridging	4 Bar — 1000 ohm	9.75	9.50
896E Bridging	4 Bar — 1600 ohm	9.85	9.60
896F Bridging	4 Bar — 2000 ohm	$10.00	$9.75
896G Bridging	4 Bar — 2500 ohm	10.25	10.00
896H Bridging	5 Bar — 1000 ohm	10.25	10.00
896J Bridging	5 Bar — 2000 ohm	10.50	10.25
896L Bridging	5 Bar — 2500 ohm	10.75	10.50

F. O. B. Rochester and Chicago only

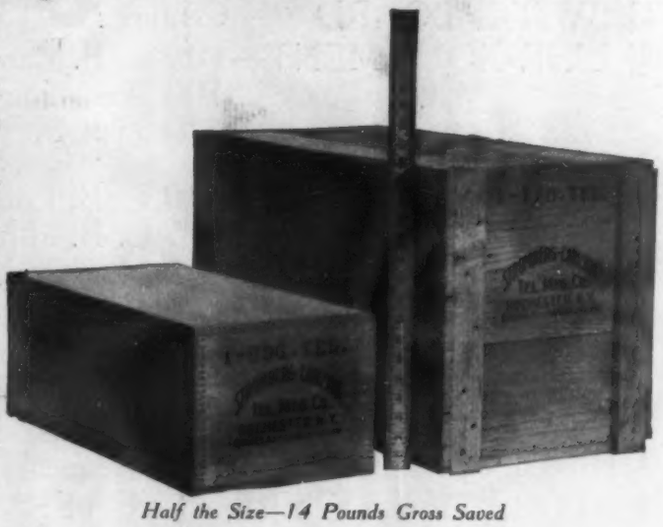
Prices for Additional Equipments

"Sure Ring" Condenser ..... 25c additional
*"Non-Interfering" Push Button ..... 25c additional
Divided Circuit and Central Checking ..... No Additional Charge

** When for use on grounded system state so in order.*

The Story of the Box

The picture tells it plainly. We redesigned our Compact Telephone so it would pack individually in a half-size strong wood box and thereby save you **30% transportation expense on every shipment.** We originated this idea and are pleased to give you all the benefits it provides, including easier handling—better storing—and simpler distributing. **Place your orders where you get the utmost for every dollar expended.** Shipment same day we get your order. Be prepared—send us your telephone orders now.



Half the Size—14 Pounds Gross Saved

Stromberg-Carlson Telephone Mfg. Co.

Rochester, New York, U. S. A.

Chicago, Illinois **Toronto, Canada**
Los Angeles, Cal. **San Francisco, Cal.** **Seattle, Wash.**

A Model Exchange

PHELPS
MUTUAL
TELEPHONE
COMPANY,

PHELPS,
NEW YORK.

Now Serving
328 Subscribers.

¶ SYSTEM —Century Common Battery 4-Party Harmonic.
¶ SWITCHBOARD —Century No. 13 Cabinet, Golden Oak Finish.
¶ LINE EQUIPMENT—100 C. B. Lamp Line Signals. For local lines.
100 Answering Jacks.
20 Type S, 500-ohm, Self-restoring, Combination Magneto Drops and Jacks for toll and rural lines.
¶ CORD EQUIPMENT— 10 C. B. Local to Local.
5 C. B. to Magneto.
5 Magneto to Magneto.
¶ SUPERVISION —Double Lamp.
¶ RELAY RACK —Steel Frame, supporting Type C Relays.
¶ POWER BOARD —White Marble Panel equipped with all modern apparatus and devices.
¶ RINGING MACHINE—Four Frequency Multicycle Converter.
¶ STORAGE BATTERIES. ¶ TERMINALS. ¶ TEST PANELS.

This Exchange was designed, built and installed complete by

CENTURY TELEPHONE CONSTRUCTION CO.

Buffalo, N. Y. **Bridgeburg, Ont.**

Please tell the Advertiser you saw his Announcement in TELEPHONY.

DIAMOND SPECIALTIES

EMPIRE CONDUIT RODS

With or Without Wheels

QUICK ACTING—POSITIVELY LOCKED—EASILY PUSHED

Specifications given in Catalogue 284. Write for copy.

DIAMOND EXPANSION BOLTS

DIAMOND N

SCREW ANCHORS

For Securely Fastening Telephone Equipment to Brick Stone and Concrete Walls

"DIAMOND N" 4-POINT DRILL

"DIAMOND N" DRILL HOLDER AND POINTS

Diamond Expansion Bolt Co.

Manufacturers of DIAMOND SPECIALTIES
90 West Street, Corner Cedar NEW YORK

"SAVE TIME AND FREIGHT"

Western Electric Company

"SAVE TIME AND FREIGHT"

New York, Buffalo, Philadelphia, Boston, Richmond, Atlanta, Savannah, Pittsburgh, Cincinnati, Indianapolis, Detroit, Chicago, Milwaukee, Minneapolis, St. Paul, St. Louis, Omaha, Kansas City, Oklahoma City, Salt Lake City, Denver, Dallas, Los Angeles, San Francisco, Oakland, Seattle, Portland.

Also Houses in All Principal Foreign Cities

Address the house nearest you.

EQUIPMENT FOR EVERY ELECTRICAL NEED

"TELEPHONE OUR NEAREST HOUSE"

A Central Exchange

CONSISTING OF

A Cracraft, Leich Magneto Switchboard

AND

A Cracraft, Leich Pulsating Current Harmonic Converter

OPERATED IN CONNECTION WITH

The Cracraft, Leich Automaphone for City and Village Subscribers

AND

The Cracraft, Leich Compact Type Magneto Telephone for the Rural Subscribers

Provides the most flexible system, giving the best up-to-date service on the most economical basis.

The greatest development along the lines of good, sane and sound practice containing features of an unquestionable character is found in Cracraft, Leich apparatus.

The points of precedence embodied in our switchboards are too numerous to mention here. Write us for full information.

Sole Manufacturers of North Manual Apparatus
Common Battery and Magneto

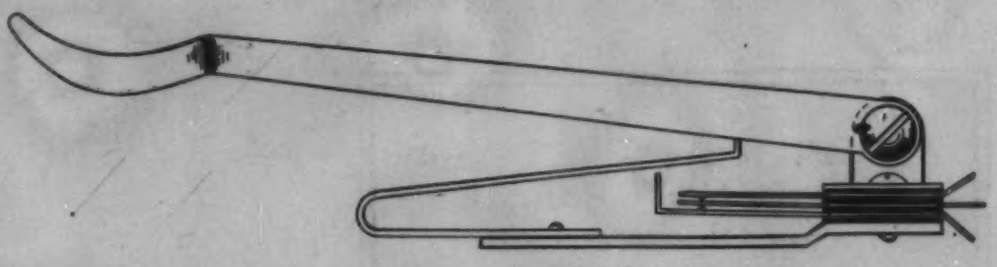
Cracraft, Leich Electric Co.

Genoa, Ill., U. S. A.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

NORTH ELECTRIC COMPANY'S *PATENTS INFRINGED*

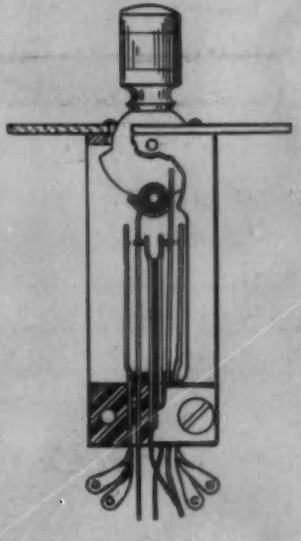
OPERATING COMPANIES who have purchased apparatus embodying the features of *North Patents*, herewith illustrated, from other Manufacturers than the *North Electric Company*, are warned to procure indemnifying evidence from their source of supply.



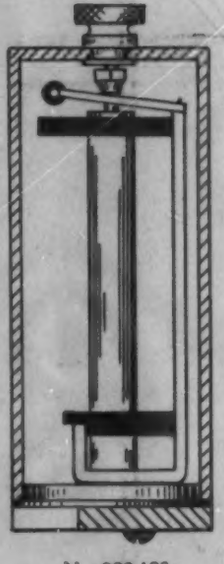
No. 660,818
Filed Nov. 15, 1899

No. 836,049
Filed Oct. 31, 1901

No. 663,196
Filed Nov. 15, 1899



No. 754,935
Filed Sept. 14, 1901



No. 822,193
Original File May 1, 1902

CORRESPONDENCE SOLICITED

THE NORTH ELECTRIC COMPANY

CHICAGO, ILL.
1343-52 Monadnock Block

CLEVELAND, OHIO
917 American Trust Building

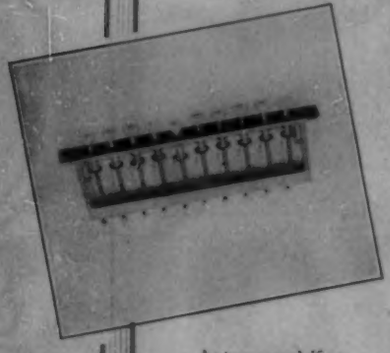
Please tell the Advertiser you saw his Announcement in TELEPHONY.

Automanual Operator

Automanual Relay

7 Keyset

Michrometer Impedance Coil



Automanual Key

Synchronomic Converter
One Unit
5 Party City
10 Party Rural

THE NEW FACTORY of the North Electric Co. at Galion, Ohio, represents the most modern facilities for the production of precision apparatus in the world. Automanual is the highest grade of mechanical development in the Telephone Art.

The Automanual Process has solved the problems from the Companies' and Subscribers' standpoints. Success through its adoption is assured.

Investigate the Process and the Automanual Trust Certificate Sales Plan.

Write for particulars

North Quality

The Telephone Improvement Co.

Monadnock Block, Chicago **American Trust Bldg., Cleveland, O.**

AUTO MANUAL

This Is Your Anchor "Ideal"

The Oshkosh Anchor is Built on An Important Law of Both Physics and Actual Practice

We desire to interest every user of anchors in the OSHKOSH Anchor. After you read this advertisement, you too, will agree with us that it is a good anchor.

Study these illustrations carefully. *Note that "sturdy" appearance.* Being the latest anchor to enter competition, which means it must be a good anchor to survive — (to win) and backed by a company having a reputation for doing things, we embraced in the OSHKOSH Anchor every principle necessary to make a good and absolutely dependable anchor. It has been tested in every condition of soil, and made good, else the history of this company which has always been never to back anything but a winner, would have caused us to drop it.

A few features which will make this anchor unquestionably "the choice of careful anchor buyers" are:

Each blade of the OSHKOSH Anchor has 50 per cent greater expansion in virgin earth than the blade of any other anchor—and in four ways instead of two.

Cannot be carelessly set. Depends on the strain of the guy strand for expansion — *the greater the strain the greater the resistance.* Convex top surface of its blades—an exclusive feature—affects wider range of soil than any other shaped blade: secures greater holding power.

"Lines of resisting force are always vertical to the plane of the point of contact.—(A law of Physics.)

Costs no more than the next best anchor.

Does the OSHKOSH match up to your "Ideal?" Is it what you have wanted? Even though a better anchor it costs no more than any other good anchor. Is there any other information you desire?

If You Expect the Best Work from Your Linemen Furnish Him with the Best—Oshkosh Construction Tools

The handles are made of the very best timber that can be gotten for that purpose. Straight grained, light and strong.

The designs are conservative—practical and just what they should be to get the best results from the least work.

Get the OSHKOSH catalog—it shows our complete line and prices.

TRADE OSHKOSH MARK **MFG. CO.**

Box 682 Oshkosh, Wis.

Chicago Office 424 S. Clinton St.
New York Office 90 West St.
Philadelphia Office Morris Bldg.

Some Recent Common Battery Installations at Home and Abroad Emphasizing Telephone Exchange Efficiency

Fort William, Ont.

Big Springs, Texas.

Bahia, Brazil, S. A.

Fort Dodge, Iowa.

Coldwater, Mich.

Hoopeston, Ill.

La Crosse, Wis.

Glendive, Mont.

Columbus, Neb.

Fairbury, Neb.

Cleveland, Ohio.

Chihuahua, Mex.

Minneapolis, Kan.

McKinney, Texas.

Sao Paulo, Brazil.

Mt. Pleasant, Iowa.

Jefferson City, Mo.

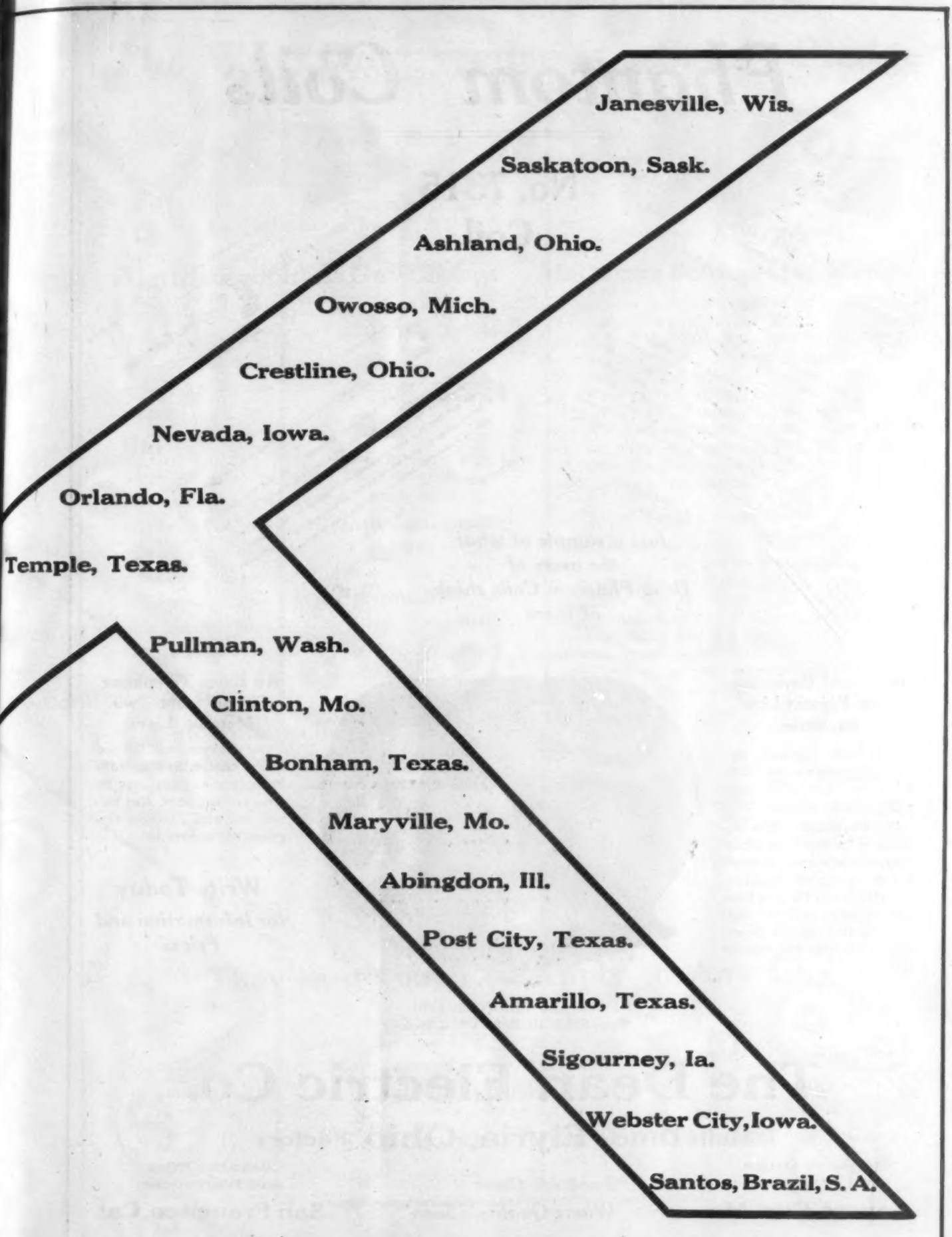
Cape Girardeau, Mo.

Salem,

Plano, Texas.

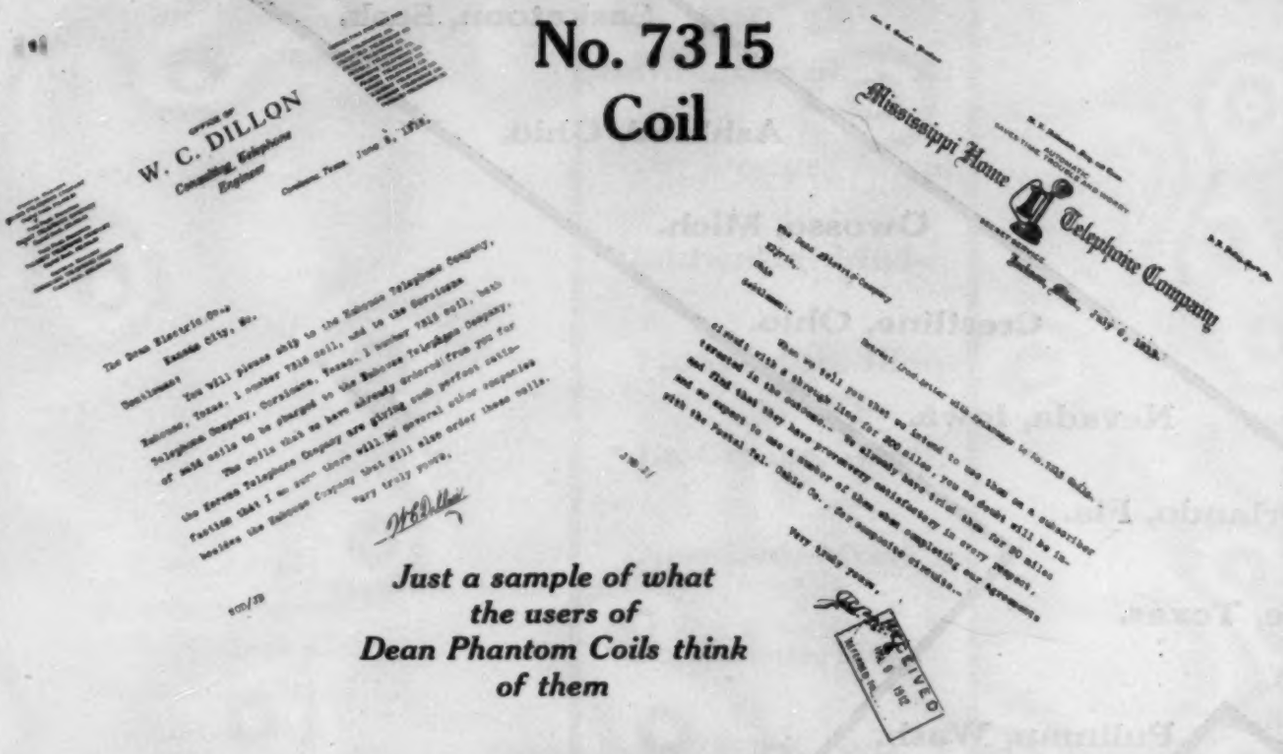
Goshen, Ind.

Pratt, Kan.


Janesville, Wis.
Saskatoon, Sask.
Ashland, Ohio.
Owosso, Mich.
Crestline, Ohio.
Nevada, Iowa.
Orlando, Fla.
Temple, Texas.
Pullman, Wash.
Clinton, Mo.
Bonham, Texas.
Maryville, Mo.
Abingdon, Ill.
Post City, Texas.
Amarillo, Texas.
Sigourney, Ia.
Webster City, Iowa.
Santos, Brazil, S. A.

Phantom Coils

No. 7315 Coil



Just a sample of what the users of Dean Phantom Coils think of them

Increased Revenues from Present Line Facilities

Additional talking and signaling circuits can be made by the use of Dean Phantom Coils at small expense.

The Phantoms will be superior to the lines from which they are made and the latter left at the original efficiency. No. 7315 Coil is for long lines and telegraph use. No. 1620 Coil (smaller size) is for ordinary toll lines and country circuits.

NO. 7315 PHANTOM COIL
Size—6½ in. diameter by 7¼ in. long

An Extra Telephone Circuit from Two Metallic Lines

Our engineers will tell you free of charge, how to work Phantoms to advantage on your present lines, also furnish you with complete diagrams of the circuits.

Write Today for Information and Prices

The Dean Electric Co.

Main Office Elyria, Ohio Factory

Branch Office and Warehouse:
Kansas City, Mo.

"Look for Dean Where Quality's Seen"

Branch Office and Warehouse:
San Francisco, Cal.

The Way They Wedge is a Safety Pledge

For ¼ and $\frac{5}{16}$ inch guy strand.

For $\frac{7}{16}$, ⅜ and $\frac{7}{16}$ inch guy strand.

Matthews Boltless Guy Clamps

are automatic in their action. As long as the strain on the guy wires does not exceed 3,000 to 4,000 pounds its clamping action is the same in every respect as that of the standard 3-bolt clamp.

But—

when the strain exceeds 4,000 pounds there is a great difference between the 3-bolt clamp and Matthews Boltless Clamp. The separate strands of wire which make the guy strand tend to compress and get closer to the center or core. This reduces the diameter of the guy strand ever so little but it is here that the 3-bolt clamp starts to slip and unless someone is there to tighten the nuts it will continue to slip until the loose end pulls through.

With Matthews Boltless Clamps

this slip starts but is immediately stopped because the wedge automatically adjusts itself to the new diameter and the slip registered on the Tensometer is always less than .005 of an inch. This is a very valuable feature and makes

Matthews Boltless Guy Clamps

absolutely the only really safe clamp to use.

In these same tests the Matthews Boltless Clamps, both the "Baby" and the "Giant," broke the guy strand which they are designed to hold. This shows that they have more strength than you will need to hold your lines.

The time that it takes to put them on is always less than 5 minutes and many large users find that their men can put them on in three. In addition to these money-saving features they cost less than 3-bolt clamps.

Trial Proposition

One hundred or more Matthews Boltless Guy Clamps will be shipped to anyone of approved credit, on thirty days' free trial. If they prove satisfactory pay for them. If not, write for shipping directions.

If shipment is made from factory in St. Louis, and you have never used them before, the freight will be prepaid on the first trial order for 100 or more. No samples are given away.

NET QUANTITY PRICES

Quantity	Baby	Giant
Less than 500	Each 10c	Each, 15c
500 to 1,000	Same	Each, 14c
1,000 or more	Each, 8c	Each, 13c
Shipping wgt. in lbs.	Each, 5⅛	Each, 1⅝

You can't lose, so why not send your order in now, on 30 days' trial?

One Large User Says That:

"They're a Cinch to Apply to Any Guy"

Manufacturers of Matthews Patented Money-Saving Specialties

3718 Forest Park Boulevard

We have disposed of our Canadian rights on Matthews Boltless Clamps to
THE NORTHERN ELECTRIC & MANUFACTURING COMPANY, LIMITED
Montreal Halifax Toronto Winnipeg Regina Calgary Edmonton Vancouver

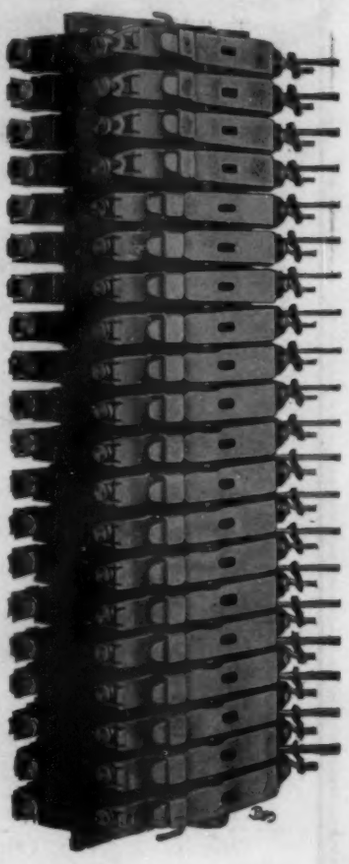
COOK

TERMINALS PROTECTORS

The only protector that will absolutely protect itself as well as the delicate apparatus back of it—

COOK'S No. 10 PROTECTOR

RE-SOLDERING, BUT NOT SELF-SOLDERING



A radical departure both in principal and design from previous types of switchboard protective apparatus. These are the features that make it superior.

¶ Heat coil is NOT made of wire; cannot burn ou or short circuit.

¶ Metal shell will not burn up and start fire in the coils above.

¶ No defective coils or loose contacts in circuit.

¶ Springs of each pair are insulated from adjacent springs.

¶ No bolt connections are used to transpose line and switchboard terminal consequently no loose connections in circuit.

¶ A re-soldering—not a self-soldering protector—the advantage is that every time protective apparatus is re-set a test is made for defects in coil.

Have you a copy of the Cook Catalog?—Write today—it's free

Frank B. Cook.

326 West Madison Street
Chicago

Western Representative:
Manny-Meyers Co.,
Seattle, Wash.

Southwestern Representative:
Tel-Electric Co.,
Houston, Tex.

CHICAGO

Please tell the Advertiser you saw his Announcement in TELEPHONY.

Write *Now* for a *Free* Sample—

WE WANT YOU TO KNOW THE

"PIONEER" DIRECT CURRENT RECEIVER

(85c complete with 36 inch silk cord)

Its simplicity of construction—sturdiness, durability and low cost—make it highly efficient—absolutely satisfactory. Hundreds of companies have found this out to their advantage.

We will send a Pioneer Direct Current Receiver free upon request—drop a postal today—or better, ***clip the coupon now.***

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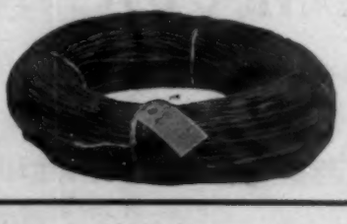

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Entered as second-class matter September 4, 1908, at the post office at Chicago, Ill., under act of March 3, 1897

Volume 64
Number 24

CHICAGO, SATURDAY, JUNE 14, 1913

Subscription - 10 Cents a Copy
$3 a Year U.S., Cuba and Mexico
$4 Canada, $5 Other Countries

SUCCESS.

Success in life is not so much a matter of talent or opportunity as of concentration and perseverance.

The Chicago Telephone Situation.

Naturally enough, much surprise is manifested at the move made by the Illinois Telephone & Telegraph Co. to secure municipal consent at this time to sell its telephone business. The company to date has pursued an aggressive policy, installed thousands of automatic telephones, improved its service and invited and secured connections with many outside companies that never before enjoyed a Chicago connection. This course of procedure inspired a degree of confidence among the Independents in the territory tributary to Chicago which will receive a more or less severe jolt at the latest news concerning the company's petition for permission to dispose of its business. Officials of the company deny that any plan is afoot to sell out to the Chicago Bell. The president of the latter company makes the same statement.

In view of past history, many telephone men may be pardoned for accepting these denials with a reservation of the right to reject them in the future.

The explanation of the Illinois Telephone & Telegraph officials that the only reason for securing permission to sell its business is to facilitate the marketing of its securities has been recorded by the Chicago press. It has been generally supposed that the financial interests back of the tunnel project were sufficiently strong to finance the proposition, especially in view of the creditable progress made by the telephone branch of the business. It is stating only the plain truth to say that in some quarters the belief has been entertained that these financial interests were more or less interwoven with the powers that control the Chicago (Bell) Telephone Co. It is, therefore, only a step to the conclusion that, if one camp desires the right to sell the competing plant, the other group of interests would not be averse to such a transaction.

The Chicago franchise sought to be amended specifically forbids any agreement "which would tend to make competition inoperative." The proposed amendment would repeal this provision. It occurs to even the ordinary observer that such a change would be likely to arouse the careful scrutiny of the Interstate Commerce Commission, which is keeping a vigilant eye on telephone maneuvers just at present. The commission would be very likely to sift the reasons, financial and otherwise, advanced for such a move—and any subsequent moves—with its accustomed diligence.

The All-Important Link.

Millions of telephone messages ripple over the wires every day, without those participating in the communication giving a thought to the operator who makes the connection and renders the message possible. Mr. Ade wishes to talk to Mr. Blake, takes down his receiver, calls his number and in a few seconds of time is deep in his conversation. Neither Ade nor Blake, probably, gives the operator or central a thought, and both—so long as the service is good—are practically unconscious of the part played by her whose nimble fingers enabled them to span the distance intervening and talk as if face to face.

The other day, the cables tell us, a militant suffragist in London called up King George by telephone, and, before that astonished monarch could collect his wits and "hang up," she was deep in a "votes for women" harangue that threatened the peace of the royal mind. Investigation showed that the wily suffragist represented herself to be the Duchess of Fife, or some other titled lady, to the telephone operator and thus secured connection with the ruler's private chamber.

It is said there was a great uproar in the royal household on account of the mix-up, but the kingly wrath passed by the telephone operator, and landed on the head of some gentleman-in-waiting, who had the audacity to grin as though it was a good joke.

Mighty, indeed, is the power of the telephone operator, who, by a mere twist of the wrist, can arrange an interview between the King of Great Britain, Scotland and Ireland, Emperor of India, etc., etc., and a brick-throwing suffragist!

The World Belongs to the Fighting Few

By HERBERT KAUFMAN

When you lose faith in yourself, your main spring has run down—the rest of the works are useless. You're letting time pass without making a record—you're all wrong inside, and a glance at your face shows everybody that you are out of order.

You're just occupying the space of a man, fit only to be directed and fitted merely for the little posts in life where hands and feet are paid for by the dime per hour. You've judged yourself and passed adverse sentence, the world won't reverse the decision. You can no longer direct yourself, so you must be driven.

The rest of us are not cheating our hour of opportunity, and since you don't care, we haven't the time to care for you. You can come wherever we go, but we don't carry you. The roads to everywhere are open. You have the same right of way, but not the right of weigh upon your backs.

The thing—the only thing—that can save you is a rewinding of the main spring—Determination.

Wishing for things is like fishing for things, wasted without perseverance. Thinking and doing aren't the same. Good ideas are only seeds. They must be planted and tilled before they can produce.

A thousand men thought that the airship was possible, but possibility couldn't become probability without hard labor.

Instead of building castles in the air, the Wrights, and Zeppelins, and Dumonts built something to carry them to the castles. They planned, and plugged, and figured, and failed, and kept failing, and kept learning from failure, until they could soar to what others merely saw.

They fell down and bumped themselves until they bumped into the right plan. They couldn't pick it out from the wrong ways until they had eliminated them by test.

Easy problems are never worth solution. The great rewards are always bought by terrific effort. Little men can only achieve little things. Windfalls are worthless. Nature and human nature are both alike—all real treasures are rock-bound.

Thousands of men had that in them which could have made them a Napoleon or a Caesar, a Carnegie or a Field, but they remained nonentities simply because, they had a fool idea that Fortune keeps a visiting list. She doesn't! She hasn't stirred from home since she first went into business. Her abode is way up among the crags. There are no beaten paths to her front door. No man who ever found it, managed to leave footprints to guide another over exactly the same route. She gives nothing. She trades and she drives her bargains just as hard as a Monday shopper. The price of her goods must be paid for in grit and ability.

Being a woman, she despises a coward. Her smiles are only for those who flatter her vanity by enduring some suffering for the favor of her graces.

In every desert there are wells. In every stretch of sun-baked bad land, there are pools. The weaklings who wander out into the sands and the wastes, do not find them. They are there for the Fighting Few. The great things of the earth are not for the doubters. No field of endeavor is so barren but what they find its oases. Some time, amid the ruins of an ancient land, a temple will be unearthed, sacred to Success, and high over the altar hewn into the living rock, these lines:

"I exist only in the Man—I am Human Will. I cannot aid those who seek help, but them who disdain to ask it. Those who doubt themselves, destroy me. They who believe, achieve!"

Copyright by Herbert Kaufman.

Chicago Independent Asks Council to Change Franchise

Illinois Telephone & Telegraph Co. Requests City Council to Release It from Franchise Clause Forbidding Sale to a Competitor—Removal of Prohibition Desired to Facilitate Marketing of Securities—Bell and Independent Authorities Deny Sale Rumors

In a letter sent to the Chicago city council, June 6, the Illinois Telephone & Telegraph Co., which operates the automatic telephone system in Chicago, requested the municipal authorities to release it from the provision in its ordinance forbidding the company from selling out to a competitor. Under the terms of the franchise authorizing the Illinois Tunnel company to operate a telephone system in Chicago, should the corporation make any agreement "which would tend to make competition inoperative," the franchise is there and then forfeited. This clause is incorporated in the ordinance of 1889. J. W. Callahan, general manager of the Illinois Telephone & Telegraph Co., signed the letter addressed to the council committee on gas, oil and electric light—which handles all telephone matters—in which escape is sought from this prohibition.

Sale of Independent Not in View.

News of this request made by the Illinois Telephone & Telegraph Co. naturally led to the circulation of the report that negotiations were on for the sale of the company to the Chicago (Bell) Telephone Co., but representatives of both corporations declared that no such move was contemplated. General Manager Callahan in his communication to the council committee stated that the reason that his company desired to be relieved from the described prohibition was because it makes it difficult for the company to market its securities.

Discussing this point, Mr. Callahan's letter says: "The original ordinance granting the telephone franchise to the Illinois Telephone & Telegraph Co. contains an express prohibition against the sale of its telephone plant to any other company doing a telephone business in the city of Chicago. The ordinance which has been introduced has for its purpose the repeal of this prohibition. The Illinois Telephone & Telegraph Co. finds itself in a position where its securities are not marketable unless this prohibition referred to shall be eliminated."

D. J. Schuyler, attorney for the company, denied the report that this move was preliminary to a consolidation of the two telephone companies in Chicago, and asserted that the reason assigned in Mr. Callahan's letter was the only one underlying the request submitted to the city council. B. E. Sunny, president of the Chicago (Bell) Telephone Co., also declared that there was no plan to amalgamate the two competing systems.

"We have no trade on," Mr. Sunny was quoted as saying. "There have been no advances made by either side for the purchase of the automatic plant by our company."

To a representative of Telephony Mr. Callahan said: "I think I can hardly amplify my letter to the counsel committee in which the the absolute facts were stated regarding our request to that body. I will say unqualifiedly that no deal with the Chicago Telephone Co. has been made, nor is there the slightest intention to open up negotiations of that character.

"The matter is simply a question of finances. So long as our franchise carries the provision referred to we are unable to interest capital in our securities. It seems to me perfectly logical that capital would shy at a proposition of this kind, which is absolutely inflexible and admits of no freedom of action whatever. With this prohibiton removed we can place our securities and secure the money needed for development."

The council committee deferred action on the communication until the next meeting, when representatives of the Illinois Telephone & Telegraph Co. will be asked to be present.

Notwithstanding the specific denials by representatives of both companies concerned, the Chicago newspapers entertain the theory that the proposed amendment is intended to pave the way to a consolidation of the two existing systems. The Inter Ocean had the following to say on the matter:

"That negotiations are under way for the purchase of the Illinois Telephone & Telegraph Co. (automatic) by the Chicago Telephone Co. (Bell) became known yesterday. This was announced following an attempt to effect the revision of the telephone ordinance, which at present prohibits the amalgamation of the Illinois company with any other locally operated concern. A merger of the two companies into one operating system is contemplated, and if realized will mean the end of two separate lines within the city. The combine, it is declared, will mean the abolition of the automatic system and the taking over of its subscribers by the Bell company.

"Owing to the belief that the instruments and plant operated by the automatic company could not be used by the purchasing company, rumor has it that the purchase of the organization is mainly for the purpose of overcoming competition and establishing a universal telephone system in Chicago. Because of a clause in the ordinance passed in 1889, prohibiting the sale of the company to any telephone corporation operating in the city, it is impossible without legislation to effect the sale."

Leading members of the city council are viewing the situation with considerable distrust. Alderman Charles E. Merriam, the most prominent reform member of the council, who is on the committee in charge of telephone affairs, has urged the committee to proceed with much caution in dealing with the question at issue. He fears that such a consolidation would give the Chicago Bell company an opportunity to increase its capital charge so as to materially reduce the city's share of the company's earnings.

Alderman Merriam's Views.

"In case the automatic company disposes of its properties to the Chicago Telephone Co.," he said, "the latter concern probably will add to its capitalization $5,000,000 or $6,000,000, which amount would represent the purchase price. The trouble in this connection comes in the fact that the property purchased would be of little or no value to the absorbing company, but, nevertheless, it will accrue for a 7 per cent. return on the added investment. In this way the entire surplus upon which the present rate reductions are based would be wiped out, which would result in the non-acceptance of the new ordinance by the company."

The campaign made by the Illinois Telephone & Telegraph Co. to secure Independent connections with companies operating in states adjoining to Illinois has been successful, and these telephone companies are, therefore, vitally interested in the situation. Several years ago the Bell endeavored to secure control of the Independent franchise, but the legislation that would have permitted such a merger was defeated.

An Ocean Telephone Call Office Off Guernsey, England

The Platte Fougere Lighthouse Station, Though Without Attendants, and Standing on a Rock That is Completely Covered When the Tide Rises, Has Been Equipped With a Telephone by Which Pilots Can Secure Connections With the Mainland Exchange

By Edwin O. Catford

Last year reference was made to the telephone being utilized as "nursemaid" at Platte Fougère Lighthouse Station, Guernsey, England, and now this station is equipped with another telephone novelty of very practical usefulness.

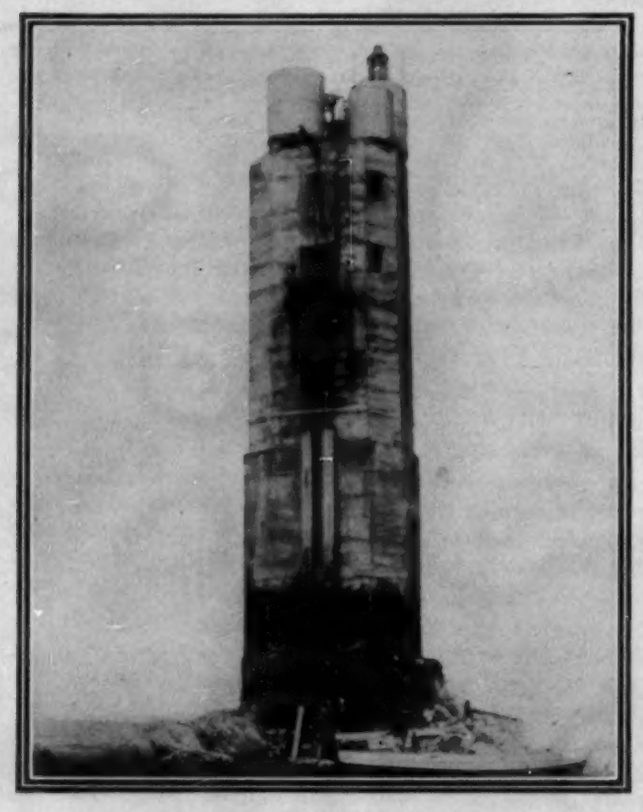
The lighthouse stands on a rock nearly 1¼ miles away from the mainland of Guernsey. It is fitted with a self-acting acetylene light and with a powerful fog horn. The lighthouse is charted as "unattended," the keepers living ashore where the power house is situated from which the lighthouse machinery is driven by means of a heavily armored submarine cable.

This cable is now being put to an additional use, to connect with a telephone installed on the platform outside the lighthouse. The platform is seen about half way up the tower in the illustration.

By climbing the lighthouse ladder any local pilot can make use of this telephone to call up the keepers ashore who can then connect through to the exchange system of Guernsey.

Pilots waiting for a vessel will thus be able to communicate with their homes and so learn if any later news of the expected boat has arrived by telegram.

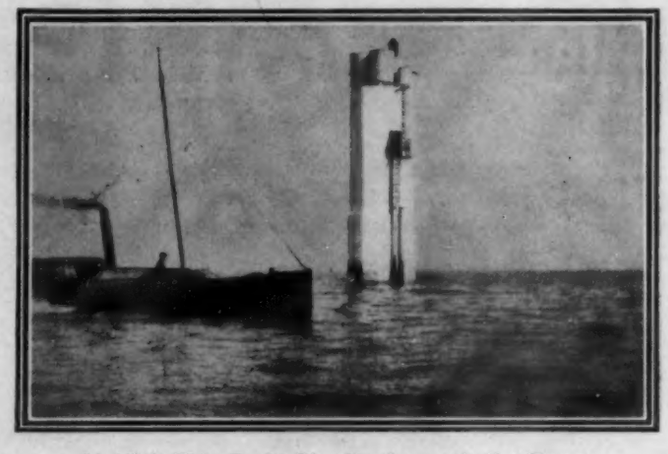
Another important use of this ocean telephone will be to obtain news of mail boats approaching Guernsey from England during fog, when, guided by the fog signal, they sometimes creep up to within two ships' lengths of the lighthouse. It has thus frequently happened that a mail boat has been for



Platte Fougere Lighthouse at Low Tide.

hours anchored within sight of the lighthouse, while Guernsey was anxiously awaiting news of its whereabouts. With the new telephone any pilot knowing of the arrival of the mail boat in the vicinity will be expected to immediately telephone the news to the central telephone exchange. In return for this service to be rendered in fog, the pilots will be given the free use of the lighthouse telephone throughout the year.

The captain of a mail boat also, if he anticipated a lengthy delay, might send off a boat with one of his officers to report



At High Tide Boats Directly Approach the Tower.

his arrival at Platte Fougère. He could also obtain information as to the state of fog both from the lighthouse keepers and from the town office of either railway company when, should the little Russel be reported clear, he might find it possible to push forward.

The chief difficulty in the way of providing the new telephone lies in the fact that only one pair of wires in the cable is available for all purposes, and these wires are already engaged in performing five separate services which must not be interfered with. This difficulty, however, can be surmounted.

It can readily be seen that the new telephone, while it is mainly expected to be of service in fog, may prove invaluable in the case of unforeseen emergencies.

The idea of establishing a telephone "call office" on the Platte Fougère lighthouse originated with the writer, who is the keeper of the lighthouse and fog signal station.

Gaining the Confidence of the Public.

The Johnstown Telephone Co., of Johnstown, Pa., has adopted a plan which ought to prove very effective in promoting a better understanding on the part of the public respecting the duties of the telephone operator. A "special invitation" card has been sent to subscribers and the card is signed by the chief operator. The card reads:

"This department is so closely related to your daily business life that I feel, in order to produce the best results, we should be better acquainted. I want you to visit our main exchange, Jackson street, June 4th, afternoon or evening, or the afternoon of June 5th. We want to show you how we handle from 50,000 to 70,000 local and over 1,000 long distance calls a day; how any operator having a call for you rings your 'phone while only one answers you, etc. Please call at my desk in order that I may know you have accepted this invitation. Bring any friends, *but don't disappoint.* Yours sincerely, M. Ruth, chief operator."

This invitation, obviously written by a woman, is both tactful and gracious, and will have a good effect even where the invitation cannot be accepted.

Supreme Court Upholds Rate Making by State Authorities

United States Supreme Court Renders Decision in Famous Minnesota Rate Case Upholding Right of States to Fix Reasonable Intrastate Rates on Interstate Railroads—Principles Applicable to Other Utilities —Principles Governing Valuation of Property

On June 9 the Supreme Court of the United States handed down its decision in the Minnesota rate case, upholding the right of states to fix reasonable intrastate rates on interstate railroads. The decision is regarded as one of the most important ever announced by the court and has been under consideration by the court for the past 14 months. As the principles laid down can also be applied to telephone companies and other utilities coming under control of state commissions, the decision is of unusual interest.

Justice Hughes announced the decision, giving the conclusions of the court as to the various points involved. The holding of the court in effect is that states not only have the authority to fix intrastate rates but that, even though these rates affect interstate rates, they are valid unless confiscatory.

Far reaching principles covering the valuation of railroad property for rate making purposes were also laid down by the court.

Scope of State Laws Defined.

Among the laws which the states may pass, indirectly affecting interstate commerce, were mentioned state inspection laws, state employers' liability laws and quarantine regulations. Justice Hughes said that state rate making was to be classified with these.

"It has never been doubted," said he, "that the state could, if it saw fit, build its own highways, canals and railroads. It could build railroads traversing the entire state, and thus join its border cities and commercial centers by new highways of internal interior course to be always available upon reasonable terms.

"Such provision for local traffic might indeed alter relative advantages in competition, and by virtue of economic forces, those engaged in interstate trade and transportation might find it necessary to make readjustments extending from market to market through a wide sphere of influence; but such action of the state would not for that reason be regarded as creating a direct restraint upon interstate commerce and as thus transcending the state power.

Has Interstate Jurisdiction.

"Similarly, the authority of the state to prescribe what shall be reasonable charges of common carriers for intrastate transportation, unless it be limited by the exertion of the constitutional power of congress, is statewide. To say that this power exists, but that it may be exercised only in prescribing rates that are on an equal or higher basis than those that are fixed by the carrier for interstate transportation, is to maintain the power in name while denying it in fact.

"It is to assert that the exercise of the legislative judgment in determining what shall be the carrier's charge for the intrastate service is itself subject to the carrier's will. But this state wide authority controls the carrier and is not controlled by it; and the idea that the power of the state to fix reasonable rates for its internal traffic is limited by the mere action of the carrier in laying an interstate rate to places across the state's border is foreign to our jurisprudence.

"If this authority of the state be restricted, it must be by virtue of the paramount power of congress over interstate commerce and its instruments; and, in view of the nature of the subject, a limitation may not be implied because of a dormant federal power—that is, one which has not been exacted, but can only be found in the actual exercise of federal control in such measure as to exclude this action by the state which otherwise would clearly be within its province."

Simplifies Valuation Work.

The decision of the supreme court has simplified the work of the railroad valuation commission. The principles governing a valuation as laid down by the court are the following:

1. The basis of calculation is the "fair value of property" used for the convenience of the public.
2. The ascertainment of that value must not be controlled by artificial rules.
3. To ascertain the value, weight is to be given to the original cost of construction, amount expended on terminal improvements, amount and market value of bonds and stocks, the present as compared with the original cost of construction, the probable earning capacity under particular rates described by statute and the sum required to meet operating expenses.

"Fair Value" of Rail Property.

The attempt of railroads to establish the cost of reproducing their property now, as equivalent to the "fair value" on which they were entitled to earn rates was regarded as doomed. The federal court in Minnesota adopted that basis. It allowed the railroad to multiply the normal market value of land by two in order to arrive at the cost of reproducing now a right of way outside of the three cities in that state. Justice Hughes tested the lower court's theory of arriving at a fair value by finding "the reproduction cost new" by ascertaining how this theory worked on the value of the railroad's lands.

He declared that the lower court was in error in adding 30 per cent. to the normal value of the land in some instances, and 200 per cent. at the big terminals, in arriving at what the court considered the "cost of reproducing its property."

"It is manifest that an attempt to estimate what would be the actual cost of acquiring the right of way, if the railroad were not there, is to indulge in mere speculation.

"The cost of reproduction method is of service in ascertaining the present value of the plant, when it is reasonably applied and when the cost of reproducing the property may be ascertained with a proper degree of certainty. But it does not justify the acceptance of results which depend upon mere conjecture."

How Values Should be Fixed.

Justice Hughes said that the railroad would have no ground to complain if it were allowed a value for its land equal to the fair average market value of similar lands in the vicinity, without additions by the use of multipliers, or otherwise to cover hypothetical outlays.

In criticising the apportionment of valuation between the interstate and intrastate business upon the "gross revenue basis," he said that the division should be made according to the use that is made of the property. He

declared that this use could not be measured by the return, when the return itself was in quesion.

"If the return be taken as the basis," said he, "then the validity of the state's reduction of rates would have to be tested by the very rates which the state denounced as exorbitant."

He added that it would not be impossible to ascertain some kind of "use units" by which the property could be divided both between interstate and intrastate business on the one hand and between passenger and freight business on the other. He did not point out what this "unit" would be.

A chronology of this important case, which is known as the Minnesota Rate case, is as follows.

April 4, 1907—Minnesota legislature passed an act reducing rates 33 1-3 per cent.

April 18, 1907—Legislature enacted law reducing commodity rates 7.377 per cent.

May 31, 1907—Stockholders of the Great Northern, Northern Pacific and Minneapolis & St. Louis railroads sue for injunction to prevent enforcing of new rates.

July 8, 1907—Judge Lochren granted a temporary injunction against the state, but the new rates, except as to commodities, were put in force pending a court decision.

October, 1907—Attorney General Young sought a mandamus to enforce commodity rates; he was arrested and fined $100 for contempt of court.

March 23, 1908—United States Supreme Court held the rate law unconstitutional, but later granted a rehearing of the case.

April 22, 1908—C. E. Otis was appointed master in chancery to take testimony in the rate case, the appointment being made by Judge W. H. Sanborn.

Sept. 21, 1910—Otis reported in favor of railroads on all points.

April 8, 1911—Judge Sanborn filed his decision sustaining the findings of Otis.

May 15, 1911—State appealed to United States Supreme Court.

Supreme Court Upholds Taxation on Earnings.

After a legal battle carried from court to court during the past three years, the United States Supreme Court on June 10 handed down a decision upholding the validity of the Michigan law, under which telephone companies were required to pay taxes on the basis of earnings. The act in controversy was passed by the Michigan legislature at the 1909 session.

With the exception of the Citizens Telephone Co., of Jackson, and the Citizens Telephone Co., of Grand Rapids, all the companies paid their taxes as provided in the new law, but these two companies in May, 1910, brought action in the federal court at Detroit, presided over by Judge Dennison. The decision was adverse to the companies and the case was appealed to the United States Supreme Court, with the result noted.

Exclusive of the 1912 tax the two companies owe the state $114,000. The Grand Rapids company is indebted to the extent of $107,000 and the Jackson company owes $7,400. Including the penalty of one per cent per month and the 1912 tax, the amount due the state will be $163,000. All of this money is to be turned into the primary school fund.

Supreme Court Refuses to Review Ohio Decision.

The Supreme Court of the United States has refused the appeal of the United States (Long Distance) Telephone Co. for review of the decision of the United States Circuit Court of Appeals of Ohio, which in March last found invalid the 99-year exclusive toll contracts between the United States Telephone Co. and various local exchanges, and dismissed an appeal for an injunction to prevent other contracts being entered into between these local exchanges and the Central Union (Bell) Telephone Co. The history of this case was briefly given in the May 31 issue of TELEPHONY.

Program for Mississippi Independent Convention.

The program of the sixth annual convention of the Mississippi Independent Telephone Association, to be held at Waldron Hotel, Corinth, Miss., June 17 and 18, has been sent out by W. N. McAnge, Jr., acting secretary. The program is as follows:

Tuesday Morning, June 17.

9:00 a. m. Meeting of the board of directors at the Waldron Hotel.

10:00 a. m. Address of welcome, by Hon. T. E. Henry, mayor of Corinth.
Response by W. H. Bryant, Mobile, Ala.
President's address, by S. J. Whyte, Kosciusko, Miss.
Illustrated lecture: "Automanual Telephone Practice," by E. C. Lewis, Chicago, Ill.

Tuesday Afternoon.

2:00 p. m. Address: "Co-operation Between the States and the National Association," by R. H. Holbrook, of Chicago, Ill.
Address: "Local Financing of Independent Telephone Properties," by J. C. Kelsey, Chicago.
Address: "The Telephone Service Association and Its Work," by Frank Eldridge, Chicago.
Short talks on technical subjects, by R. E. MacDuff, S. M. Lewis and F. A. Rader.

4:00 to 6:00 p. m. Visiting exhibits, second floor Waldron Hotel.

Wednesday Morning, June 18.

9:00 a. m. Address: "What the Independents Have Accomplished in North Mississippi," by Dr. J. E. Givhan, Pontotoc, Miss.
Address: "Motor Driven Vehicles in Exchange Maintenance," by J. E. McCarthy, Guntown, Miss.
Election of officers.

Wednesday Afternoon.

1:30 p. m. Automobile trip of eighteen miles through the "Historic Shiloh Battlefield."

9:00 p. m. Smoker at the Waldron Hotel.

Mitchell, S. D., Votes for Municipal System.

At a special election held at Mitchell, S. D., on June 10, bonds to the amount of $60,000 were voted for the erection of a municipal telephone plant. The city refused to renew the franchise of the Dakota Central Telephone Co., which expired on May 11 and attempted to compel the company to remove its entire equipment from the streets by that date.

Telephone Cable Across Mediterranean Sea.

A new telephone cable is to be laid shortly between Marseilles in France and Algiers in northern Africa, according to the Annales des Postes, Télégraphes et Téléphones. The core will consist of seven copper strands, each 0.8 mm. in diameter, with three layers of gutta percha, weighing in all 52 kg. per (nautical) mile. The resistance will be 9.2 ohms and the capacity 0.35 m. f. per mile, and the insulation resistance 300 megohms per mile.

The armoring of the deep-sea portion will consist of 16 2.5 mm. steel wires, that of the intermediate cable 12 4.5 mm. steel wires, that of the coast section ten 7 mm. steel wires, and that of the shore end, 12 4 mm. steel wires. The cable will be laid with 4 to 8 per cent. slack.

A Quartet of Men Prominent in the Telephone Field

JAMES H. SHOEMAKER, general manager of the Corn Belt Telephone Co., Waterloo, Iowa, was born at Middle Springs, Pa., in September, 1865. In 1872 he removed with his parents to Missouri and three years later to Marshall county, Iowa. From 1883 to 1903 he was connected with what is now the Chicago Great Western Railway, serving as telegraph operator and station agent at Reinbeck, Des Moines, Dubuque and St. Paul. In 1903 a party of men who had acquired a controlling interest in certain properties, which afterwards were represented by the Corn Belt Telephone Co., engaged Mr. Shoemaker to look after the business details of the enterprise. Although this was his first experience in telephone work, when A. T. Averill became president of the Corn Belt company Mr. Shoemaker was chosen as general manager. He also became treasurer and a director of the company. He was elected secretary, treasurer and director of the United Exchange Co., and vice-president, manager and director of the New Hartford Farmers' Telephone Co. He was elected president of the Iowa Telephone Association in 1908.

HAROLD C. MARSH, manager and owner of the Shirley Telephone Co., Shirley, Ind., was born at New Milford, Conn., in August 1884 and was educated at the New Milford high school, Williston Seminary and Rensselaer Polytechnic Institute. He started his career as a surveyor, doing work for the New Milford Power Co., and state road engineering for the state of Connecticut. He was surveyor for the American Telephone & Telegraph Co. from 1905 to 1906, and from August, 1906, to May, 1909, was respectively lineman, troubleman and foreman for the Woodbury Telephone Co., Woodbury, Conn. He was solicitor for a few months for the D. & M. Co.'s Telephone Co., Anderson, Ind. From November, 1909, to May, 1910, he was district manager of the Great Eastern Telephone Co. New York city. In May, 1910, he became superintendent of the Winsted Local Telephone Co., Winsted, Conn., and in April, 1912, he became foreman of the Southern New England Telephone Co., from which position he resigned in October, 1912. In November, 1912, he bought all the capital stock of the Shirley Telephone Co. and has rebuilt the plant.

W. JACKSON BELL, president Friendship Telephone Co., Oxford, Wis., was born in Newport, Sauk county, Wis., in February, 1863, and was educated in the common schools. He started in the telephone business in 1880 and has been active therein and in electric lighting since that time. After a number of years' service for the Bell company he resigned to engage in organizing, building and selling electric light and telephone plants. Mr. Bell was the first man to manufacture and sell reconstructed telephone apparatus, a business in which he is still engaged, his operations including the states of Wisconsin, Minnesota, Indiana, Illinois, Iowa, Arkansas, New York, Washington and Montana. He was a charter member of the Wisconsin Independent Telephone Association and served as executive chairman for several years and a charter member of the Interstate Association. In 1888 and 1889 Mr. Bell, together with Thos. A. Edison and Harold P. Brown, gave testimony which led to the adoption of electrocution as a means of capital punishment in New York.

E. L. KLINGEL, Minnesota representative of the Dean Electric Co., of Elyria, Ohio, with headquarters at St. Paul, Minn., was born at Edwardsville, Ill., in November, 1883, and was educated in the common schools. Immediately after leaving school he started in the telephone business, entering the employ of the Bell company as troubleman at Edwardsville, Ill., in 1901. After two years of work he was promoted to the position of exchange manager and in the period from 1903 to 1906 he served as manager for the Bell company at Vandalia, Mt. Vernon and Effingham, Ill. In 1907 he was appointed manager of the Kavanaugh Telephone Co., at Effingham and held this position until 1908, when he resigned to engage in the manufacturing end of the telephone business. He became salesman for the Dean Electric Co. and was assigned to the Ohio territory. He continued in this position until 1912, when he was transferred to St. Paul as Minnesota representative. Mr. Klingel has attended numerous conventions of the telephone associations. He is an Elk.

June Inconsistencies

The Stock Market—Seeking a Jonah

By J. C. Kelsey

New York is seething with excitement; 815,700 shares were thrown headlong into the market; American Tobacco lost $17 a share. Nervous prostration everywhere! Everything going to the bow-wows!

It got so bad that a bank president gave out a wise, owl-like interview.

In an instant the world grew calm! The troubled waters became tranquil. We have found the Jonah! He is to be pitched overboard.

That Jonah is the administration. It is the same old Jonah that has bothered these nervous financiers as far back as Heck.

In earlier days it was Roosevelt, then Taft, now Wilson! That is what we need—a Jonah!

The president of the National City Bank has spoken.

Those of you who have been in the open market for switchboards have heard of this philanthropic institution. You received a telegram from some one connected with this bank, that it would be a great and beautiful thing if you bought a Western Electric board!

I have often wondered, after you had bought the Bell board according to their telegram, what would happen to you if you went to New York and tried to tell the president of this bank what you had done.

I know what would happen, and so do you.

Now listen to the words of the wise New York banker: "Our country suffers from lack of confidence in men."

Well, the secret is out! Great armies of men who once grew rich in underwriting, now find their occupation dead. No bond or stock issues have much chance in popular subscription these days, because the public has reason to have a lack of confidence in men. The men who fooled a great army of investors on Rumeley stock—$15,000,000 worth—seem to be the same men who sold Frisco.

Think of it! Selling bonds on a property which was only 30 days from receivership! Who wouldn't lose confidence in men?

We learn from an unknown lawyer in St. Louis that the Frisco trouble is due to interference from Washington. Another Jonah has been found!

It is a dead sure thing that our country is enjoying a lack of confidence in men.

I don't see any suffering, unless it is among stock brokers in New York. Every day you see where brokers close up branch offices. You know why—suckers have ceased to bite!

And we have another reason from this wonderfully wise New York banker.

"It's prosperity (our country's) has been immeasurably retarded by the persistent misrepresentation of those who are influential in the conduct of public affairs."

If the men in charge of public affairs had not been persistent, every stick of timber, every ton of coal, and every waterfall would be in the hands of the men who now seem to lack the confidence of the public.

I know that it requires lots of money to operate a home on Fifth Avenue or on Long Island.

It is a lasting shame that our public officials interfered with the graft. If it had kept on, there would be nothing left. As far as I can see, the government at Washington should be praised for jumping in even at the late hour.

And going farther, you have a chance to learn that, "There never was a time when a generous spirit of confidence was more essential." There you have it!

Take the locks and bars from your doors. Have a generous spirit, leave the house open, and if you hear a marauder, tell him to help himself.

Subscribe for every issue of bonds and stocks handled by these men who have so cruelly skinned you in the past. Give them a few years more because they are getting older, and it is harder to make a living.

Now for the confidence or "bull," as some are prone to describe it: "Our resources are so great, the virile spirit of our people so fine, the possibilities of development so unlimited, it is unfortunate that we do not have a diffusion of a spirit of confidence and good feeling between all classes of men."

That is what bothers Wall Street. It is a shame that everyone can't feel good over his losses. It is wrong that the virile people should have so little pride in our magnificent Wall Street!

It is the possibilities of development that worries Wall Street men. You know their ideas of development.

You are to furnish the money, and let them manage the development. Sometimes you get 6 per cent.—most of the time you do not.

I honestly think that New York financiers should show some real, honest acumen and learn how to make a dollar for the stockholder before bemoaning the lack of confidence. I will wager that 95 per cent. of the enterprises handled by the New York element have been bitter failures. That is enough reason for lack of confidence.

"Security prices, which measure in some degree the world's wealth, have contracted by over a billion dollars.

"The cause of this shrinkage is in part due to world-wide conditions, yet a contributory cause is the distrust and illwill against those who do their part in developing the natural wealth of the world."

There you have it! The shrinkage is due to your distrust, and to your illwill.

The reason for the shrinkage is none other than that suckers are no longer crowding the brokerage offices. Suckers have had a long tedious experience, but they seem to be learning.

The sorest man I ever saw was a three-shell confidence man at a Kansas circus. He was doing a nice sucker business until the marshal arrested him. No one in New York has been arrested, but the suckers are standing back, suspicious of the shells.

All New York money-changers have to do to get back into the graces of the security-buying public is to let the security buyer not only make an occasional dollar, but to preserve him from bitter losses.

Victims are persistent, but finally they do learn. When you get right down to it, the so-called Wall Street wizard, with his alleged quickness of thought, and his unerring judgment, is a myth. Nobody is so helpless and depends so much upon reports and advice from underlings.

It is about time the investors of the country awakened. If they would put their money in home securities under such terms as the larger security dealers insist upon, we would have the biggest prosperity wave the world has ever seen.

A dollar invested at home gives 100 cents to the property. A dollar invested in New York is lucky if 60 cents goes to productive use. That is what bothers New York —a realization of their utter inefficiency.

New York is no place to run a western railroad or any other concern. The cost is too great.

The longer the world lives, the nearer they will come to learn that unproductive costs are what ruins properties and cuts off the investor's revenue.

The government should go further. It should investigate every corporation or enterprise which has ceased to pay dividends or interest. It would certainly put an end to a lot of extravagance.

It would be hard upon the relatives of influential stockholders. Many sons-in-law would have to go to work at $12 per week, where they now get $12,000 a year.

Depriving stockholders of dividends should merit capital punishment to the management, unless they could give some very excellent reasons.

I know of a typical company which has never paid a dividend. The president drew $20,000; an incompetent crazy son drew $10,000; a son-in-law $8,000; and there was quite a sprinkling of the family getting other things, such as free electric lights, etc.

Simply grand larceny—nothing else!

In spite of the tumble in stocks in New York, you have noticed no excitement. Even in Chicago people calmly go to work and every factory wheel goes right on turning. No one is losing any real money and no one seems to be blue except those who are in chronic indigo all the time.

Independent telephone interests are in no wise disturbed. We have been providentially barred from participation in New York financing. Today, the industry goes calmly on, practically earning its own way.

Business was never better. Collections always up to the high level, and failures few and far apart. A peculiar business too, and one in which you always need additional capital; one that could easily absorb the investment money of any district and infallibly pay returns; one that is unhampered by Frisco failures; and one that does not disturb French and German bankers.

Financial men have so far overlooked the best business of all. Simply because they were bluffed by the New York interests.

Independent telephone interests are not asking more renewed confidence in men. They don't need it. We have had confidence in men, but we know at the same time that it is foolish to rely on any business which depends upon confidence in self-chosen leaders.

In my 15 telephone years I have seen many contradictory and inconsistent things. We have seen unsuspecting investors robbed even in our own business.

We had unscrupulous promoters, too, and I have seen men in convention rave and shed tears for their beloved cause of Independent telephony.

These same men sold out to the Bell, and betrayed their better-meaning, though more silent, neighbors.

Somehow I do not blame Bell men for despising many features of Independent telephony. Bell general managers have told me in confidence of many of our old patriots who spent most of their time in Bell offices, figuring on the ruin of unsuspecting neighbors.

But my point is: the business survived all this—it saw hard sledding. Independent telephony has no less crimes to hide than its competitor, who went to sleep and then had to fight so desperately for its life.

We have had inconsistencies, just as the wailing New Yorkers, inefficiencies, cupidities and all.

King David said all men were liars. I believe he knew what he was talking about.

I have heard it said that Independent telephony has no leaders. It never had and never needed any. It survived all alleged leadership. It moved on in spite of the crowd which pretended to control it.

The fact is, Independent telephony has had to exist on its own merit. And today, merit is the only test.

I have a letter calling my attention to the fact that the future of Independent telephony is doubtful if the Western Electric factory continues to build up its business with Independent companies. The argument is that Independent companies will be more easily weaned to the Bell side.

This is the biggest June inconsistency.

I don't agree with any one who says that dealings with the Bell factory will influence Bell leanings.

The Bell factory came into the field with a brass band, and they were backed by New York banks, and every other device they knew of. Today, the Bell factory is a joke in the so-called Independent field.

MORAL: Glass houses are still popular.

Financial Reports of Mississippi Companies.

Three Mississippi telephone companies recently filed reports with the Mississippi Railroad Commission showing revenue earned during the quarter ending May 31. These reports were as follows:

Mississippi Home Telephone Co., Hinde county: Receipts, $3,900.44; operating expenses, $1,516.31; net earnings, $2,384.18; net revenue, $1,895.66; for same period last year, receipts, $3,671.49; operating expenses, $2,273.89, net earnings, $1,836.43; net revenue, $1,797.58.

Meridian Home Telephone Co.: Receipts, $7,640.30; operating expenses, $2,800.00; net earnings, $4,840.30; net revenue, $4,380.80; for same period last year, receipts, $6,947.18; operating expenses, $2,891.27; net earnings, $4,055.91; net revenue, $3,636.50.

Hattiesburg Home Telephone Co.: Receipts, $3,900.00; operating expenses, $1,250.00; net earnings, $2,650.00; net revenue, $2,161.96; same period in 1912, receipts, $3,980.65; operating expenses, $1,736.29; net earnings, $2,244.36; net revenue, $2,029.38.

Annual Meeting of the Northern Illinois Telephone Co.

At the recent annual meeting of the stockholders of the Northern Illinois Telephone Co., at Sandwich, Ill., the regular semi-annual dividend of 3½ per cent. was declared, payable September 1. The report of Secretary E. E. Wallace showed a gain in revenues in the face of two sleet storms that put the toll lines and many lines from various exchanges out of business for several days. President F. S. Mosher stated that despite the tremendously heavy expense involved in the reconstruction of the lines damaged by the two storms, the financial condition of the company was in excellent shape.

Many of the lines that were wholly or nearly destroyed were those first built by the company and the work of rebuilding them is now being done. Shorter and heavier poles are being used and more of them to the mile are being put in.

Engineering in the Construction of the Outside Plant

Conclusion of Article Dealing with Factors in the Planning of a Telephone Plant — Determination of Estimated Number of Telephones and Classification of Possibilities— Distribution of Facilities and Layout of Cable Plant

By B. C. Groh

The total existing possibilities and the total 15-year possibilities having been estimated, it is necessary to distribute the ultimate over the ultimate area of the community. This work calls for considerable judgment. The following are some of the factors to be considered:

The ultimate business area.

The ultimate exchange area.

The possible change in character of a district from a residence to factory in character.

The vacant property in the existing settled area.

The replacement of residence buildings by apartments.

The establishment of new street car lines and the extension of present transportation facilities.

With the above factors in mind, the ultimate number of lines must be distributed on the map by blocks in the same manner as the present estimated lines. The ultimate may be placed on the same map as the present, as shown in Fig. 4, with a line separating them. The figure above the line is the estimated number of ultimate and the figure below is the estimated number of initial lines. Where no line is shown, the single figure is the ultimate and the block is vacant or has no possibilities at present. After the present and ultimate distribution is made, it is advisable to designate the distribution

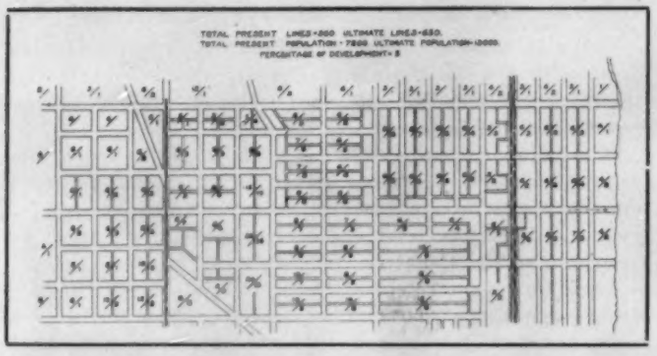


Fig. 4. Map Illustrating Ultimate and Present Distribution.

center for the present and ultimate. This is very important for new plants and where a change in exchange quarters is contemplated. The center of distribution can be determined in the following manner:

Begin at one side of the community, say the east, and count all present estimated lines until one-half of the total is obtained. Then draw a line north and south at this point. Repeat this operation beginning at the north end and when one-half the total number is reached, draw a line east and west. The point of intersection will be the center of distribution. Ascertain the center for both the present and ultimate. If new exchange quarters are contemplated, they should be located midway between the ultimate and present center. It must be borne in mind that this is the theoretical center. The cost of quarters and the character of the repavement when underground conduit is to be installed, may change this location. The question resolves itself into one of plant cost and the exchange quarters must be located on a strictly cost basis, but as near the theoretical center as is consistent.

It will be seen that Fig. 4 shows the ultimate and present distribution of lines for a section only of a community, and no center of distribution is shown for that reason. The next step is to design a system of wire distribution for the district shown on Fig. 4, and Fig. 5 shows the distributing system for this district. It is made by placing a piece of tracing cloth over Fig. 4 and drawing on this, the skeleton feed. The sys-

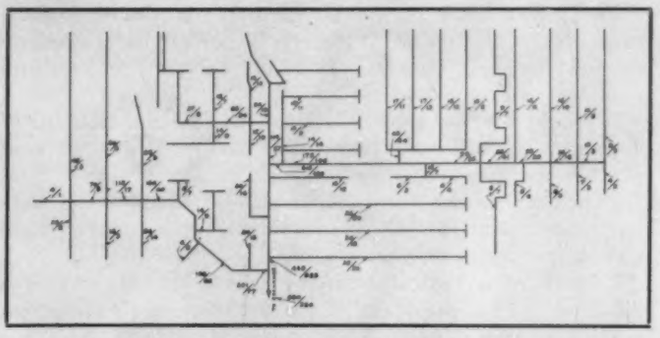


Fig. 5. Wire Distribution in Section of Community.

tem of distribution must be made from an actual inspection of all streets and alleys and the necessary private right of way that it is economical to secure. The figures show the ultimate and present lines necessary. It will be noted that the figures at any point in the main runs, show the total lines necessary at that point, and that the figures at the point marked "To Exchange" check with the present and ultimate shown for the district on Fig. 4.

The conduit plan or the underground work necessary to properly meet the requirements of the plant and also of the municipality is next determined. The section of city used as an example, is an actual instance in plant design in which underground requirements are specified by the authorities. Therefore, more underground work is planned than would in many cases be necessary with a similar study in a city or town with less stringent requirements in the matter of placing the underground.

Fig. 6 shows the conduit plan together with the number of ducts to install for the ultimate requirements. It is obvious

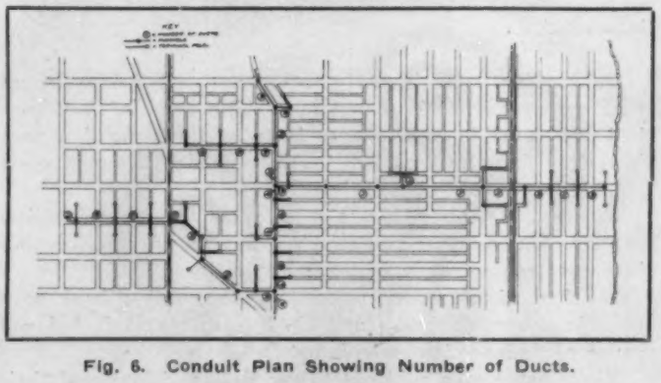


Fig. 6. Conduit Plan Showing Number of Ducts.

that underground shall always be installed for the ultimate requirements.

In Fig. 7 is shown the number of ducts to install for a given number of ultimate lines. All laterals should be of two ducts. It is also customary to provide one duct for the city for all

main conduits, and this duct is included in the curve below.

The underground plan having been determined, the initial cable plan should be designed. In planning a cable system many features must be considered, and local conditions will vary to an extent that no set rules can be followed.

It is not advisable to use cable in conduit less than 400 pair

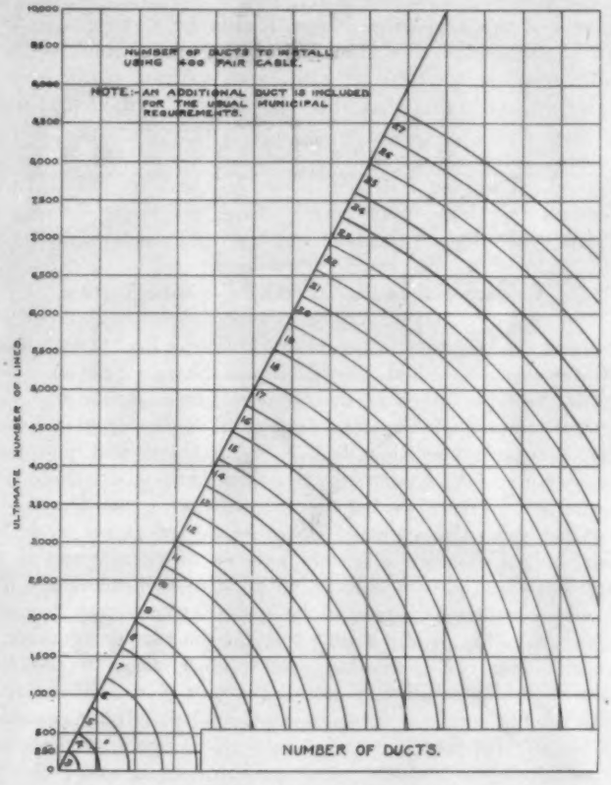

NUMBER OF DUCTS TO INSTALL USING 400 PAIR CABLE.
NOTE:-AN ADDITIONAL DUCT IS INCLUDED FOR THE USUAL MUNICIPAL REQUIREMENTS.
ULTIMATE NUMBER OF LINES
NUMBER OF DUCTS.

Fig. 7. Determination of Ducts for a Given Ultimate.

unless the cable recommended will take care of the estimated ultimate requirements.

Except in the larger cities 400-pair cable is recommended for underground work. Cables larger than 400-pair should be used wherever existing duct capacity will not accommodate the ultimate cable requirements with 400-pair cable. Whenever new conduit is being installed in cities of moderate size, the number of ducts should be determined on the basis of 400-pair cable.

Aerial cable should not be less than 50-pair in size except possibly at the extreme end of the cable, and where the ultimate is small. The advisability of tapering aerial cable to

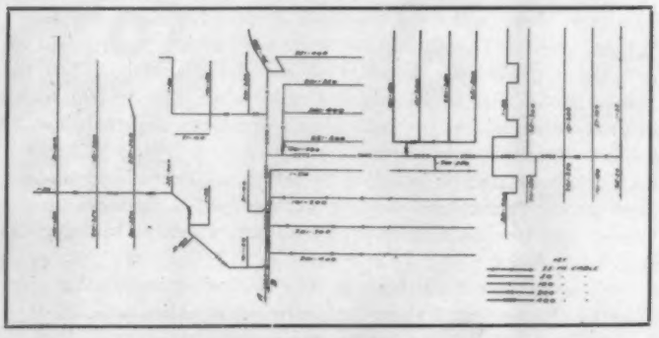


Fig. 8. The Initial Cable Layout.

a size smaller than 50-pair resolves itself into a question of initial cost. The time consumed in changing the size of cable and the extra reels of cable necessary to haul out on the work and back, when aerial cable is tapered, in many cases is more than the saving made in the cost of the cable. It must be borne in mind that the design of the distribution of a cable must be so planned as to enable as many pairs as possible to be used or be available for use. For this reason an extensive system of multipling is recommended for the initial installation.

In planning cable distribution it is advisable to divide each

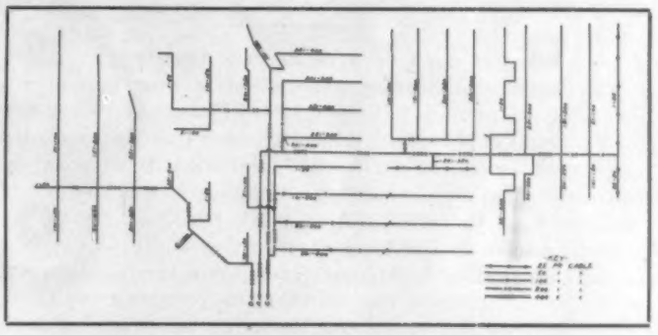


Fig. 9. Ultimate Cable Layout for District.

cable in divisions of 50 pairs and treat each 50-pair division as a separate cable.

The initial cable layout together with the count of the pairs in each leg or branch is shown in Fig. 8. The method to be employed is to repeat this operation until all legs are assigned conductors. In deciding the district that each cable should cover in the case used as an illustration, it is first decided that inasmuch as 360 lines are necessary for the initial installation, two 400-pair cables shall be installed. This will result in an initial cable efficiency of 45 per cent. After a study, the resulting layout shows cable *A* using 197 pairs and cable *B* 163, which is as evenly as the district can be divided in a practical manner. After the conductors are assigned, a statement is made as shown in Table No. 2, and the total lines in each 50-pair division ascertained. In order to uniformly fill each 50-pair division, some changes will be necessary. It will be

Initial Fill of 50 Pair Divisions of Cable A.

Conductors.	First Cut Out.	Second Cut Out.	Third Cut Out.	Fourth Cut Out.	Total.
1- 50	5	7	8	0	20
51-100	8	0	9	0	17
101-150	3	11	7	0	21
151-200	10	13	10	0	33
201-250	3	12	13	0	28
251-300	6	8	0	14	28
301-350	6	7	5	11	29
351-400	7	0	5	9	21
Total					197

Per cent. fill = 49.3.

Initial Fill of 50 Pair Divisions of Cable B.

Conductors.	First Cut Out.	Second Cut Out.	Third Cut Out.	Total.
1- 50	12	1	9	22
51-100	14	5	6	25
101-150	10	2	15	27
151-200	10	6	0	16
201-250	9	3	0	12
251-300	9	9	0	18
301-350	11	14	0	25
351-400	11	7	0	18
Total				163

Per cent. fill = 40.8.

Table No. 2. Schedule of Cable Conductors.

seen that the fill of each 50-pair division, as shown under the heading of "Total," is fairly uniform. If the first designating of conductors does not result in a fairly uniform fill, the count in certain legs should be changed so that the result is a uniform fill of each 50-pair division.

The assignment of conductors should be so made as to make the installation of additional facilities possible with as few cable cuts as necessary. Fig. 9 shows the ultimate cable layout for the district. This is accomplished by the addition of one 400-pair cable making the cable capacity 1,200 pairs for 650 lines, and with the ultimate lines evenly distributed over the three cables.

Plans of the Telephone Service Association.

The Telephone Service Association is now in its own offices at 1014, 39 So. LaSalle street, Chicago, as announced in TELEPHONY May 31. While it has no connection with any other organization, being maintained strictly as an organization of the operating companies, it will co-operate with every telephone association at all times.

The association has been sharing the offices of the National Independent Telephone Association for the past few weeks, arrangements for working in harmony with the National body and occupying the same office having been made a couple of months ago by the executive committees of the two associations. As the work of the Service association progressed, it was found that a general feeling prevailed that this organization should be operated individually with its own offices, and such action has been taken. As is generally known, the association proposes to assist the operating telephone companies in every way possible, and is prepared to take care of the inquiries of its members for advice at all times. The various committees of the association are composed of the best engineers in the field, and splendid results have been secured through the association by many companies. As future plans are completed, many features highly beneficial to the members will be available.

One of the most important matters now being handled is the distribution of the new operating rules. Requests are being received for the new books from telephone companies in all parts of the United States and Canada, and it is felt that these books are the best that have ever been compiled for the Independent companies. Therefore, it is sincerely hoped that all will assist the association in securing the adoption of these books by every company in the field. The book is gotten up in loose leaf form with art canvas cover, contains 72 pages of up-to-date information for the proper handling of long distance traffic, with several blank pages for any special rules that may be effective in the local offices. These rules will be furnished to members of the association at 25 cents per copy, and to non-members for 50 cents per copy.

At the executive committee meeting of the association, held in Chicago on May 28, several matters of importance were acted upon, including arrangements for incorporating the association and development of plans for its financial support. Naturally some of the larger companies are carrying more than their share of the load, but in order to make the organization what it should be, this, with the financial assistance of all the smaller companies, is necessary. It was also felt that the association was of great interest to all the manufacturers, and so it was decided to solicit every manufacturer for a contribution towards the support of the organization. As continued Independent telephony and better service means more business for them, it is hoped that every manufacturer supplying the Independent telephone companies will do his share in supporting this work. No recommendations regarding equipment or supplies will be made by the association, all manufacturers being treated with the same courtesy. It is also hoped that they will all help to promote the interests of the organization through their sales departments.

The dues of the association have been placed on the following basis: A minimum fee of $5 per annum for companies with 500 units or less (a unit being one telephone or one circuit mile of toll line); for companies with over 500 units, the fee to be one cent per unit per annum. Checks should be made payable to the Telephone Service Association and forwarded to the treasurer, L. J. Wylie, Decatur Home Telephone Co., Decatur, Ill., or sent to the association's office at 1014, 39 So. LaSalle street, Chicago.

Engineering bulletins will be sent out to members at intervals, the first of which will soon be issued.

F. L. Eldridge, the manager of the association, will devote most of his time to calling on various companies in order to ascertain what the organization can do to assist them.

Many other things will be done for the benefit of the industry. The association's office is open to every Independent telephone man at all times, and those coming to Chicago are invited to make it their headquarters.

Calgary Police Signal and Telephone System.

The city of Calgary, Alberta, Canada, recently awarded the contract for a complete police signal system and a description of it was published in The Electrical News. The office will be of the type known as the Gamewell type "A" or unit type central office. The system derives its name from the fact that the main operating desk is so arranged that additional circuits may be added to the existing outfit at any time it is desired to increase the number of circuits on the system.

Heretofore, the standard police signal operating desk has been built to operate a certain number of circuits and if the city where the desk was installed grew to such an extent that it was considered advisable to install extra circuits, it was necessary either to buy a new desk for the required number of circuits or to build another central office which would take care of the extra circuits. With the unit type desk, which is built on the sectional book case principal, it is only necessary to buy the required number of units to take care of the initial installation. Should the city desire to install extra circuits, these units can be added to the existing desk. The desk being furnished the city of Calgary consists of eight box units, one test unit, two flashlight units and one stable unit.

Other apparatus supplied the city is as follows:—one P. B. X. telephone board which will be arranged to handle all telephone calls received by the police department. This will not only give communication between any of the police officials and the city telephone exchange, but will give intercommunication between any two officials or between any patrolmen calling from a street box to any police official. Auxiliary equipment also includes 70 exemplar police boxes, 41 flashlight brackets, complete, 70 six-inch double vibrating gongs, and 29 combination street posts, complete. The posts will be arranged for mounting both the police signal and fire alarm boxes which are located on the same corner. At the top of the post there will be a two-light fixture having a red and a green globe. The red globe will be illuminated at night at all times to indicate location of the fire alarm box, but the green globe will be illuminated only when the central police signal office wishes to call a patrolman to a signal box to receive instructions.

There will also be installed 70 relays for operating call bells and green lights, one motor-generator set, a storage battery board and storage battery rack, and six telephone sets for the officials' offices.

At the present time there is only one other installation similar to the one at Calgary, this being at Elizabeth, N. J.

Pioneer Telephone Man Pensioned.

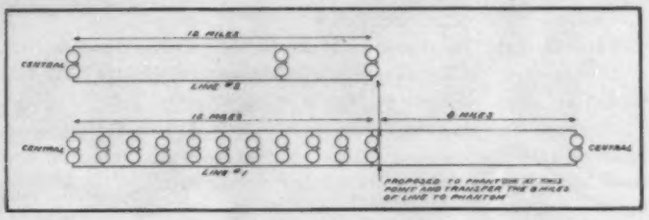
William Wilhite, who is now in the new business and promotion department of the Bell telephone company, at Canton, Ill., and who has been in the employ of the company for 32 years, has received notice that he has been placed on the life pension list of the Bell company.

Queries on Theory and Practice

Phantom Circuit is Possible.

"We have two No. 12 iron circuits, as shown in the accompanying sketch. We wish, if possible, to make a phantom from these. What advantage will it be to cut in condensers in each bell circuit on line No. 1? The lines run for about five miles parallel to a 22,000-volt transmission line."

You can successfully make a phantom circuit of the two physical lines shown in your diagram, provided the insula-



Arrangement of Circuits Which Are to be Phantomed.

tion and the joints are good, and the transpositions are correctly made. The addition of a condenser of suitable capacity in series with each bell may or may not have a beneficial effect on the ringing. In general, there is a tendency for the condenser to raise the impedance of the bridge, and in this way, while lessening the current to each bell, is makes the bells ring with more nearly equal loudness. The bells near the ringing generator will not rob the bells farther away as much as without the condensers.

High Impedance of Ringers.

"I would like some information regarding various points mentioned in "The Telephone Inspector and Troubleman." In TELEPHONY, Vol. 64, No. 18, it is claimed that a telephone will talk through a non-inductive resistance of from 50,000 to 100,000 ohms, and in Vol. 64, No. 2, it is claimed that a 1,600-ohm bell, upon a line having ten bells bridged, only shunts 2 per cent. of the voice current. It further states that the resistance to the voice current of the 1,600-ohm coil is about 80,000 ohms, this impedance being caused by self-induction. I have discovered that, upon bridging party lines of from 15 to 20 sub-stations, by connecting the receiver in series with one of the 1,600-ohm bell coils, the receiver would get sufficient of the talking current through the bell coil so that talking could be easily understood. All bells that I have tried vary but little in this respect. It seems to me that the impedance of the 1,600-ohm bell coil cannot be 80,000 ohms, as the voice current upon a 20-station line would be sufficient to go in multiple through 20 80,000-ohm resistances, besides what the talking instruments use.

"What per cent. of the voice current is shunted by 20 bells upon a bridging party line when two parties are talking and each bell shunts enough current to make the talking plain in the usual type of receiver of 100-ohm resistance."

It is true that the telephone will talk through a high non-inductive resistance. Tests have shown that this resistance may often run as high as 1,000,000 ohms. Conversation can be held through a condenser formed of two small coins with a piece of condenser paper between them, also through high resistance made of a lead pencil mark.

Conversation can therefore be held through a 1,600-ohm bell. When it comes to the leakage caused by a bridging bell placed across a telephone circuit, the impedance not only of the bell, but also of the receiving apparatus, must be taken into account, assuming each bell to have an impedance of 80,000 ohms. The joint impedance of 20 bells will be 1/20 of this, or 4,000 ohms. It may be assumed that the impedance of a receiver and the secondary winding of induction coil will not exceed 300 ohms. Therefore the receiving apparatus must be considered to be shunted by an impedance of 4,000 ohms.

Of the total current generated by the originating telephone, only a small part will go through the leak consisting of the 20 bells. This fraction will be 300/4,300, which equals 0.07; that is, the bells would very likely take about 7 per cent. of the total current. This rough method of calculation, while not giving correct results, is sufficiently accurate to show that the bells will take but little of the current.

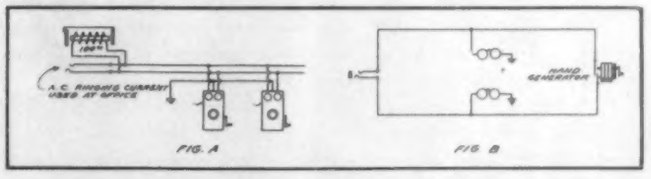
In order to take one-half the current generated by the speaking telephone, the joint impedance of the bells on the line would need to be as low as that of the receiving telephone. It can be readily seen that this would give each of the 20 bells an impedance of about 6,000 ohms. This is somewhere in the neighborhood of the impedance to the low frequency ringing current at from 16 to 20 cycles per second, which a good bridging bell possesses. Since the frequency of conversation current is about 800 cycles per second, one can see that the impedance is very much higher than when ringing current is sent over the line.

Connection for Special Ringing.

"The diagram (Fig. A) shows a crude design of a line, of which we wish to install several, that works all right when the operator rings the stations. The trouble that I find with it is in getting either station to ring central without ringing the other. I tried the four following methods: (a) with 1,000-ohm ringers; (b) same as (a) by taking one magnet out of the three-bar generator; (c) with 2,500-ohm ringers; and (d) same as (c) by taking out one magnet of the three-bar generator. Yet they ring together, being specially loud when the ring off drop is across the line. My test line is about 50 feet long. I knew if I could get them to work on so short a line, that they would work on a line of greater resistance. I believe that my solution is to install a direct current generator instead of an alternating current generator."

Your sketch (Fig. A) does not show the interior wiring of the telephones so that we must conjecture the ringing circuit. Assuming that it is as shown in Fig. B, with the bell of each telephone from one side of line to ground, we can readily see how the bells ring badly, even with the clearing out drop across the cord circuit while a subscriber rings.

The current passes from the hand generator through one bell to earth, up through the other bell to line and



Circuit for Special Ringing.

so back to the generator. In such a case as this, you can make it work by putting about 20,000 ohms in series with each bell, weakening each subscriber's generator by removing one bar; and if necessary, using higher voltage for ringing from the central office. Use the 2,500-ohm bell.

Hearing on New York Rates.

Commissioner Decker, of the Public Service Commission of New York, Second District, held a hearing the past week at New York on the complaints of Harrison B. Weil, Douglas Robinson, and the Globe Realty Co. against New York Telephone Co. as to rates.

Proceedings Before Commissions, Courts and Councils

Discussions and Rulings of State Bodies Having Supervision of Telephone Companies, Decisions of Courts in Matters Affecting Public Relations of Utilities, and Actions of City Councils Bearing Upon Franchises, Rates and Service

Ft. Meyer Physical Connection Matter Adjusted.

The Interstate Commerce Commission has announced that an amicable agreement has been reached between Ft. Meyer and the Cheasapeake & Potomac Telephone Co respecting physical connection between the Ft. Meyer private telephone system and the Bell company's switchboard. The disagreement arose by reason of the refusal of the Bell company to comply with the request of Ft. Meyer residents that the Bell trunk lines be connected with the private switchboard of the Ft. Meyer system, which was operated by signal corps men. The two switchboards were in the same building within a few feet of each other. The former assistant secretary of war was appealed to and the matter was turned over to the Interstate Commerce Commission.

Under the compromise which has been reached the telephone company has connected all the private system telephones at the garrison to its board and the old private board has been taken out. The telephone company wins its point as to refusing to use the privately owned switchboard, but the private telephones of the garrison, which are not Bell telephones, are connected with the Bell switchboard.

The telephone company denied the jurisdiction of the Interstate Commerce Commission, but, owing to the settlement, this point remains undecided.

Mutual Company Not Under New Jersey Commission.

Deciding that a purely mutual telephone association is not a public utility within the meaning of the act of 1911, the Board of Public Utility Commissioners of New Jersey has dismissed the petition of the Farmers' Union Telephone Co. of Sussex county for a determination as to the necessity for the formation of the Farmers' Mutual Telephone Co., a rival organization.

The controversy between the two companies was the outcome of a determination on the part of the Union company to increase its rates, a question which was recently before the board. Many of the members of the Union company objected to the proposed increase, and it was through their efforts that the Mutual company was organized. The Union company then appealed to the board to restrain the Mutual company from operating, upon the ground that it would prove a public detriment rather than a benefit.

The present decision of the board is based solely upon the question of jurisdiction arising from the contention that a mutual telephone association is not a public utility, and, therefore, not subject to the control of the board.

Proposed Municipal System for Ft. Francis, Ont., Canada.

Some years ago the town of Ft. Francis, Ont., granted a five-year exclusive franchise to the Rainey River Telephone Co., which was renewed for the second period of five years about 1911. The town of Ft. Francis is now seeking to establish a municipal telephone system and has applied to the Ontario Railway & Municipal Board for its approval of the undertaking. Francis Dagger, the board's telephone advisor, has been instructed to investigate the conditions in Ft. Francis and report as to the advisability or otherwise of letting the municipality come into competition with the local company.

Under the recent movement in Ontario legislation any municipality proposing to parallel an existing system must offer to purchase such system and if the company is not satisfied with the offer the Ontario Railway Board may decide as to what is a fair and reasonable price, and in event of the company's refusing to accept the figure so fixed the municipality may proceed to construct its system.

Rural Rate Increase in Norfolk Co., Ont., Canada.

The Ontario (Canada) Railway Municipal Board has just issued an order authorizing the Norfolk County Telephone Co. to increase its rates for rural service from $12 to $15 per year on condition that a continuous service be given and that not more than 10 subscribers are on any one circuit.

Home Rule Feature Eliminated from Illinois Bill.

The administration public utilities bill in Illinois has been sent to third reading in the house. It was amended so as to eliminate the feature which provided commissions for cities of under 20,000 population and which permitted cities of over 20,000 to come under the law on a referendum vote, and now provides for one commission for the entire state. The amendments adopted change the entire course of the measure, but leave a harmonious bill, in the opinion of Chairman Rapp of the house utility committee. Lesser amendments to the bill require the consent of the state commission to the renewal of notes issued by utility companies and eliminate the provision giving the commission power to order the erection of new buildings and fix the site thereof.

Franchise Ordinance at Aurora, Ill.

An ordinance granting a 20-year franchise to the Inter-State Independent Telephone & Telegraph Co. has been presented to the city council of Aurora, Ill. The ordinance gives the company the power to make the same charges as the Chicago Telephone Co. When the population of the city reaches 40,000, the rates will be revised by the city council. The company will pay $1.00 per year per subscriber, city tax. Twenty free telephones will be furnished the city. The company will not be allowed to transfer its franchise rights, to merge or to consolidate with any other company without the approval of the city council. Wires within the fire limits, excepting where they are now strung on poles, must be placed underground.

Second Service Test in Lincoln, Neb.

The Nebraska State Railway Commission recently conducted a second service test of the telephone service of the Lincoln Telephone & Telegraph Co. in Lincoln, Neb., along lines somewhat similar to the test reported in the May 10 issue of TELEPHONY. The test was made under the direction of Secretary Powell of the railway commission and the assistant working under him made some 15,049 calls. The calling was done in most instances from telephones of business establishment and was done between 8 a. m. and 6 p. m.

A portion of the time in which the test was made was a rainy period, but it was claimed that less trouble was experienced than in previous rainy periods. An individual record was made of every telephone tested and these were turned into the office as fast as collected, which they were compiled by office assistants.

At each place visited by an investigator to test the tele-

phone in calling other numbers, inquiries were made as to the character of the service being given. Many companies expressed dissatisfaction, others stated that there had been improvement, and others complimented the service.

Manager L. E. Hurtz of the Lincoln Telephone & Telegraph Co. concluded there was a great deal of difference in the service showing of the two tests and that the figures in the present test indicated an efficiency of approximately 96 per cent.

The following is a summary of the test covering a period of eight days:

	Total.	Pct. of total.
O. K. on first call	9,053	60.20
Busy on first call	1,461	9.70
No answer on first call, O. K. on second call	987	6.54
No answer on first and second call, trouble reports line O. K	1,750	11.63
No answer on first call, busy on second	231	1.53
First call "information" operator answered and said "No. discontinued"	216	1.43
Wrong number on first call	323	2.15
No answer on first call, wrong number on second	110	.73
No answer on first and second call, trouble operator said "Line in trouble"	674	4.46
No answer on first or second call, trouble reported "Don't answer"	49	.33
No answer on first or second call, trouble says "No such number"	27	.18
First call information operator answered and said "Number changed"	87	.58
First call "information" operator and said "Telephone on dead line"	57	.38
No answer on first call, "information" operator answered and said "No. changed" on second call	24	.16
	15,049	100

Logansport Company Surrenders Charter.

The Logansport Home Telephone Co., of Logansport, Ind., has voluntarily surrendered its city charter which it has held since 1901 and has filed articles of affiliation with the new public utilities commission. In explanation of this action Walter L. Uhl said:

"The law creating the Public Utility Commission placed us partially under its control, and in order to simplify the situation and not have divided responsibility, subject both to the public service commission and to the city of Logansport, we deemed it better to surrender our charter and place the company under the control of the state commission.

"The public utilities commission will now investigate the holdings of the Home Telephone Co., inquire into rates and returns on the capital invested and if the rates are found too high they will be lowered and if found to prevent adequate returns on the investment the rates will be raised."

Tax Issue at Des Moines, Iowa.

The Iowa Telephone Co. (Bell), of Des Moines, Iowa, operates under an ordinance by which the company is assessed $1 per year on every pole within the city and $1 per year on every mile of underground wire. The company has 13,000 poles and 27,000 miles of underground wire and the tax therefore amounts to $40,000 this year. This tax was payable on June 1, but the company refused to make payment. Similar action was taken by the two telegraph companies. The minimum fine under the ordinance for failure to pay the tax is $5 per pole and $5 per mile of underground wire, the maximum being $100 per pole or mile of wire. Also, each day of default is declared to constitute a separate offense. If the company does not pay the tax by July 1 the ordinance provides that the city may order the company to withdraw every pole and mile of underground wire from the city.

In commenting on the situation Mayor Hanna said that the companies will be given a reasonable time to pay the tax and that if they do not do so action under the ordinance will be begun. The mayor says the ordinance was adopted in order to secure from the telephone company a proper compensation for the use of the city streets. The company has steadily refused to apply for a franchise which, if granted by the city, would provide a return to the city for the privileges given the company.

Competing Companies Cannot Consolidate in Montana.

The citizens of Hamilton, Mont., recently appealed to the Public Service Commission of Montana in the interest of a proposed consolidation of the Bell and Independent telephone companies of Hamilton in order to do away with the necessity of paying for two services. At the request of the commission, Attorney General Kelley, of Helena, has rendered an opinion in which he states that the Montana law forbids the consolidation of two competing telephone companies in the state.

Telephone Deal in Western Arkansas.

The Citizens Telephone Co., of Paris, Ark., has acquired the Franklin County Telephone Co., of Charleston, Ark., the Sixmile Telephone Co., of Ratcliffe, Ark., the Scranton Telephone Co., of Scranton, Ark., the Logan County Telephone Co., of Paris, Ark., and one or two other systems in that vicinity. It is stated that Conrad Elskin, of Paris, Ark., will be manager of the company.

Merger of Plants at Lansing, Kan.

Negotiations between the officials of the Lansing Telephone Co., of Lansing, Kan., and the People's Home Telephone Co. of Leavenworth, Kan., have resulted in an arrangement whereby the Lansing company will acquire all holdings of the Bell company at Lansing and when formal permission of the state commission has been secured the merger of the two plants will take place.

Doing Away with Poles in Albany.

Through an agreement between the New York Telephone Co. and the Municipal Gas Co., about 200 poles will soon be removed from the streets of Albany and about 600 poles will be used jointly by the companies. The New York Telephone Co. is spending about $150,000 in an outside system of wires and cables in the city. At the next meeting of the common council the aldermen will consider an ordinance to appropriate $20,000 to be expended in placing the fire alarm system in the business section of the city in conduits. With the passage of this measure poles will practically disappear from all streets in the business section.

Rewards for Operators of New York Telephone Co.

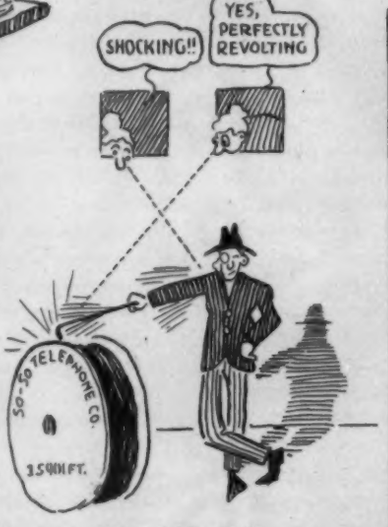
The New York Telephone Co. has adopted a plan by which operators will each receive a present of $25 in gold at the end of their second year's service. At the end of the third year and each successive year up to and including the sixth year each operator will receive $50 per year, and at the end of each year thereafter $100. A change has also been made to provide remuneration for Sunday and holiday work. At present operators who work Sundays and holidays receive a full day off during the week. This will be continued, but in addition they will receive one-half pay for Sunday and holiday work.

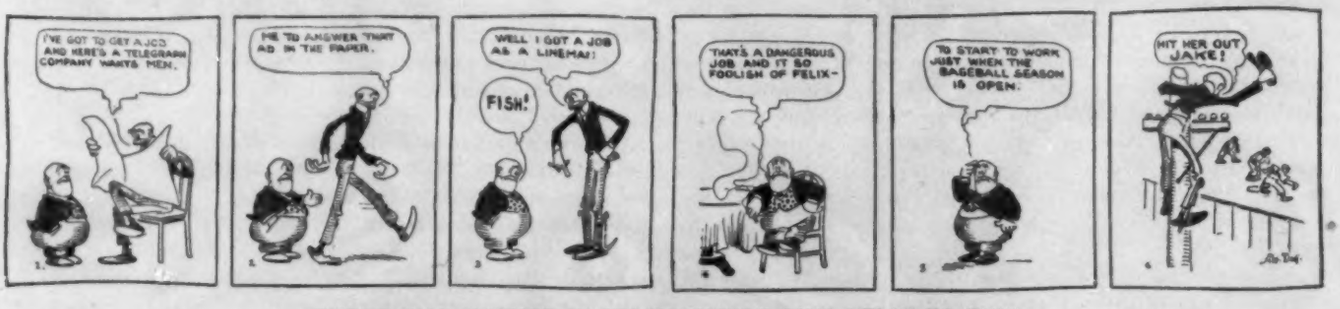
Home Companies Acquire Bell Plants in New York.

The Dunkirk & Fredonia Home Telephone Co. has acquired the plant of the Bell system at Fredonia, N. Y. The Portland Telephone Co. has acquired the Bell exchange at Brocton, N. Y., and the Westfield Telephone Co. has acquired the Bell system at Westfield, N. Y. At Fredonia and Dunkirk, N. Y., toll connections have been established between the home companies and the Bell system.

FAMOUS TELEPHONISTS
NAPOLEON— THE MAN WHO CRIPPLED ENEMIES' LINES
WIZE KING SOLOMON ALWAYS CALLED FOR "INFORMATION"
I SHOULD WORRY
BLACK BEARD HUNG UP AFTER GETTING HIS PARTY
I'LL ADMIT I RAISED CAIN
MOTHER EVE GOT ADAM'S NUMBER
NEVER AGAIN
COLUMBUS MADE THE FIRST LONG DISTANCE CONNECTIONS
HARRY THAW GOT SPLICED TO A LIVE WIRE AND THEN BLEW OUT A FUSE

This and That About Telephones
By W. L. Capple
KENNETH THE SWITCH BOARD ARTIST SAYS:
THE REASON I HAVE TWO EARS AND ONE TONGUE IS SO I CAN HEAR MUCH AND SAY LITTLE




I'VE GOT TO GET A JOB AND HERE'S A TELEGRAM COMPANY WANTS MEN.
ME TO ANSWER THAT AD IN THE PAPER.
WELL I GOT A JOB AS A LINEMAN!
FISH!
THAT'S A DANGEROUS JOB AND IT SO FOOLISH OF FELIX-
TO START TO WORK JUST WHEN THE BASEBALL SEASON IS OPEN.
HIT HER OUT JAKE!

"THERE WAS METHOD IN MY MADNESS," SAYS FELIX TO FINK.

The Evolution of Commission Control of Public Utilities

Rapid Spread of Idea Since New York and Wisconsin Adopted Measures Providing for Commission Regulation in 1907—Some of the Difficult Problems with Which Commissions are Confronted—Arguments on Questions Relating to Rates

By W. W. Anderson
Electrical Engineer, The Lloyd-Thomas Co.

The solution of the questions involved in controlling public utilities adequately seems to lie in some sort of governmental regulation, although there have been a number of advocates favoring government ownership. At any rate, it is almost universally conceded that utilities should be under some form of control, and the state utility commission, which has been coming into favor so rapidly, is a long step toward the proper regulation of these utilities. This form of regulation has been attacked in a number of cases, but it seems that such attacks come from those who have not made a thorough study of the issues at stake.

Pioneer States in Utility Control.

New York and Wisconsin may be regarded as the pioneers in the development of a system of comprehensive control over state public utilities. These states adopted the measures in the year 1907 and these acts have been generally followed by a number of other states in forming legislation on this subject. It is also evident that a number of states which have passed legislation establishing these commissions have failed to embody all the good points in the New York and Wiconsin laws and are therefore inferior in some respects to those enacted by these two pioneer states.

A comprehensive idea of the rapid spread of these commissions can be had from the following:

The Oklahoma Corporation Commission was established by constitutional provision and came into jurisdiction over electric companies in 1908.

Michigan, Nebraska and Vermont followed in 1909, and Maryland in 1910, by placing electric lighting companies under a regulating commission's jurisdiction. Since 1910 the growth in this direction has been rapid, as there have been a number of states added to this list each year, with a tendency towards giving the commissions greater control.

Connecticut, Kansas, Nevada, New Hampshire, New Jersey, Ohio and Washington established commissions in 1911; Arizona, New Mexico, California, Oregon and Rhode Island in 1912. The commission in New Mexico was not given control over the rates of electrical companies, as was done in the other states.

Maine, West Virginia, North Carolina, Indiana, Missouri, Colorado, Montana, Idaho and the District of Columbia have established commissions in the present year with jurisdiction over electric utilities.

In the states of Pennsylvania, Delaware, Tennessee, Illinois and Minnesota bills creating public utility commissions are pending.

Public utility commission bills have recently been defeated in Iowa, Kentucky, South Dakota and Utah.

In the states of Alabama, Arkansas, Florida, Iowa, Kentucky, Louisiana, Mississippi, North Dakota, South Dakota, Texas, Utah and Wyoming there are no gas and electric utility commissions, although there are railroad commissions in all except Utah and Wyoming, most of them having jurisdiction over telephone, telegraph and street railway corporations.

It would seem that the rapid growth of this movement was due to the desire of the corporations to have their questions of rates, capitalization, earnings, valuation, etc., handled by a body that would give fair consideration to the questions involved, and an equal urgent desire on the part of the people to see that service of a reasonably high grade was furnished at a fair charge. Since the utility commissions are founded on the principle of serving both the people and the utility with fairness, it is therefore easy to account for the rapid growth of the movement.

While these commissions are not infallible and are apt to err in many cases, they are a long step toward arriving at the proper method of adjusting the questions that are continually arising between the utility and the user. Except in some rare cases, they are as popular with the utilities as with the people. It will be some time, however, before control of this sort is entirely satisfactory, due principally to the complication of the questions involved and the unsatisfactory source of information and the manner in which this information is obtained.

Some of the more difficult problems for solution with which the commissions are confronted from time to time are the following:

Is a physical valuation a fair basis on which to compute rates?

What is going concern value and should it be considered in establishing rates?

What rate of return on the investment should be allowed?

What is the proper method to use in arriving at the present value of the property in question and on which value should the above rate be computed?

How should the depreciation reserve be handled and on what should it be computed?

These questions have been given considerable attention, but there is yet a great deal to be said concerning them. There seems to be no fixed standard lines to be followed, although there are already certain general tendencies discernible which forecast to a degree a definite standard for the future. The various commissions have considered these questions a number of times and there are certain principles involved which have been passed on often enough to establish them in a general way. The conditions have been such, however, that the principles have not been specifically established.

Basis of Rate Making.

It has often been argued that the questions have no place in connection with establishing rates and that the rates charged should be computed from the standpoint of the value of the service to the consumer; that commission control is an injustice to the utility as well as to the public, as it is pointed out, the management knows to what extent it can advance the rates for service without creating a popular clamor which it is anxious to avoid; and furthermore, that the public is willing to be charged according to the value of the service. Therefore, rates will naturally adjust themselves.

The folly of these arguments are clearly seen when it is considered that the various public utilities, especially the telephone and electric light, have come into such wide

usage and are used to such good advantage, at least by the business world, that a rate based on the value of this service to the consumer would involve a wide range of rates to fit the various cases. These rates would almost universally be much higher than present rates, as most anyone in business will agree that it would be almost impossible to get along without the telephone or electric lights at any price.

Neither have past experiences proven to us that the ones representing the investor have a definite limit as to what the public can afford to pay, or if such a limit existed, they have gone beyond it in a number of cases, much to their own disadvantage. It would seem, therefore, that commission control is an advantage to the investor, both in assisting him to get a fair return on his investment as well as to curb the tendencies to self injury by overcharge. On the other hand, it is of value to the public in that it guarantees good service furnished on the basis of reasonable profits to the investor.

In an early issue of TELEPHONY I hope to take up the questions above outlined, giving consideration to the many perplexing details that are involved.

Practical Subjects—Letters and Discussions

Letters From a Retired Lineman to His Nephew.

Podunk Valley Farm.

Dear Ben: I'm sitting by the window, Ben, just watching the world go by. After all the chances I've taken, on flimsy old sticks waving in the wind, half blinded by sleet, snow and rain, chance caught me on the bare ground in a most unexpected manner.

Once before I came near getting smashed up, if not killed. I'll tell about that first. I doubt if you have yet faced a crisis where you lost your nerve. I don't mean by that getting excited, losing your temper and also control of yourself—that isn't losing your nerve, that's foolishness. And I don't mean coming to the bank of a stream, raging, rolling, and filled with drift-wood; sizing up a leaky old scow on the shore; and concluding you won't cross. That's plain common sense and good judgment.

What I mean is to come suddenly face to face with something from which there seems no escape from almost certain death or worse—well the best way, is to tell you the story.

On fall Walter Berry and I were sent out into the mountians to help get a six-wire line cleaned up for the winter. There were eight or ten of us, all tough, husky fellows, and we were paired off and given a certain number of miles to cover. About all we expected to find was broken glass and loose ties. An attempt had been made to follow an old mountain trail in building the line, but there were a good many long cuts where we had to take a few dozen insulators in a pack, and hike. We had a wagon and driver who generally knew about how far we would have to walk.

About two o'clock one afternoon when we had been following the line pretty close for about ten miles, the driver stopped. He said we'd have to take our packs and hike right along up the spur for a mile and a half where the line jumped across Rattlesnake Gulch. Then we'd have to hike back again for the spur was about 400 feet above the trail.

It was about the toughest hike I ever tackled. I'd seen rattlesnakes before but Walt hadn't. Along this spur they were more than plentiful. The going was so rough and the snakes so plentiful that when we reached the last pole, we dreaded the trip back. About a quarter of a mile back, I looked down at the trail and concluded I could make the climb, just shelving rocks with other steep slopes between. From above it looked easier than to hike all the way back.

Well, I tackled it, telling Walt to wait and see how I came out. I made the first ledge easily. The second didn't look so easy but I thought I could make it and let myself over the ledge. The holding was much poorer than the slide above. The face of the rock appeared to be smooth, at least I couldn't get a foothold or a hold with my stick. I plowed right through the three inches of soft dirt and leaves, till I was satisfied I was going over a precipice which I did not see from above. It was thin! I lost my nerve—that is, every atom of resistance against destruction, both mental and muscular, left me. I was fully conscious as my head and arms swung around and I came to the edge—and stopped. There I was looking down on a sea of jagged boulders 50 feet below.

It was several minutes before I was able to begin to work myself to a safer position. I finally got down to the trail, back a half a mile or so but next time I'll walk.

Now I've had my second experience of this kind. There's been a big stone right by the path to the barn. As the path wore down, the stone became more prominent until it was just high enough to strike the bottom of a pail as I walked along the path. The other morning it caught a pail of hog feed and spilled a couple of quarts into my rubber boot.

By noon that stone was on the stone boat and it was a beauty, almost round and two feet and a half through. Right after the next shower I hitched old Bess to the stone boat to take the stone where I wanted it down by the barn. Doc says I'm not up on navigation of stone boats. Anyway on a side hill the stone rolled off, knocked me down and proceeded to roll me out lengthwise. I caught my left leg, and when I swung my right foot in its face, it just crumpled it into the mud and all thought and power of resistance left me until the stone rolled over my knee and stopped. I believe a breath of wind would have brought it on down upon me. That same old invisible force was laughing at me.

My left foot is pretty badly bruised and two small bones broken. The right foot is bruised also. The soft ground and my heavy boots saved me from worse injury. Doc. says that I can try the crutch game in about two or three weeks.

Well, Ben, I suppose the lines have all undergone a pretty severe strain during the winter. The next job is to itemize the damage and make plans for repairs during the summer.

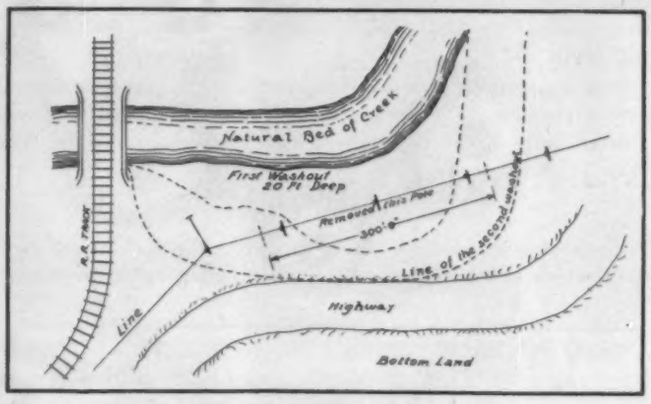
There will be one, two and three men jobs. There will also be some heavy jobs where a gang of perhaps six or eight men are needed. All your executive ability will come into play to make the clean-up economically. If you can start your men out on the little jobs and arrange to bring them together where your heavy work is to be done, it looks to me like an economical way of going about it. One of the main factors in keeping a gang of men up to the efficiency mark is to have the necessary material and tools on the job when the work begins. Another point is to have the work properly explained and laid out in detail.

Even if you do your best you'll miss it sometimes. I remember one case where the general foreman made a

bad guess, even after every side of the proposition was put up to him. The situation was about like this.

The line was built near an insignificant little stream, not very near at that—150 feet or so, as the sketch shows. For ten years nothing happened and then one night Crooked Creek went on a rampage.

It took a notion to wander a little and plowed out a



The Washout at Crooked Creek.

basin 20 feet deep and about 200 feet across, leaving one pole hanging and two others on the bank's ragged edge.

The general foreman decided to make a long span over the basin. He acted against everybody's advice. The highway commissioner was an old settler, a rather droll fellow. Crooked Creek wasn't any respecter of persons, he claimed, and she'd get another mouthful of water sometime sooner or later and go right on out into the bottom land. The railroad people took his advice and faced their embankment with stone. They made plans to change the highway and advised putting the telephone line on the bottom land. Even though the poles would stand in water in the spring, there would be no danger of a washout.

It wasn't six weeks until another wash came and the line went out clean for three spans, including the corner pole. You'll find that local wise men can sometimes give sound advice. Your Uncle Dick.

Constructing Gang Opportunities.

[Editor's Note.—The following article, reprinted from the New England Telephone Topics, is addressed to the man who feels that he is being held back by lack of opportunities and who thinks that he is not advancing rapidly enough.]

To the ambitious and energetic man who is determined to advance himself as rapidly as possible in his chosen line of work in spite of all difficulties, the construction gang offers a broad and unlimited field bristling with opportunities.

The very fact that he is working in the construction gang is, in itself, an opportunity. The construction gang, engaged in development work, is, and always should be, considered an exceptionally well fitted training school wherein men are grounded, by practical everyday experience, in the fundamental principles of telephone construction. The amount of constructive knowledge gained is wholly controlled by the amount of application and observation put into the daily work.

Let us begin first with the position of groundman:

This position is the first held by the inexperienced man and should only be considered as a stepping stone to better things. The groundman is practically a student lineman, as that is the next position above him and it is the one to which he would naturally bend his energies to reach. As the lineman's helper, the use of his powers of observation, combined with common sense and the ability to ask questions, will advance him well upon the road to a higher rating. The habit of close observation is a very important one, and should be well cultivated. The reasoning powers should also be developed as much as possible, as it gives the man those essentials so needed in the higher positions, namely, self-reliance and self-dependence.

The groundman should reason out for himself why work is done in a certain manner—why this is done and this is not done—and if, after a reasonable amount of time and thought, he is unable to do so, he should ask and apply the knowledge gained to future problems. In other words he should at all times consider himself as a pupil of the lineman and his daily work as lessons, to be thoroughly understood and mastered.

Every foreman carries with him a set of the standard specifications and these should be the lesson books of not only the groundman but of the lineman as well. If the noon hours that sometimes are spent in idleness, were spent, instead, with the standard specifications, it would help a long way towards that new rating.

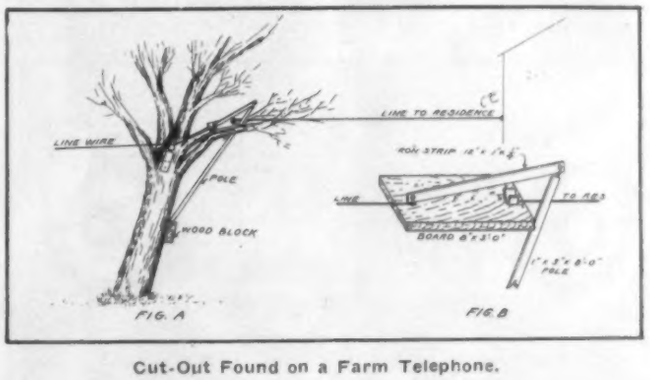
With the passing of the examination and the advancement to a higher rating, the groundman, now a lineman, should never for an instant relax his search for knowledge. Taking now as his teacher, the foreman of the construction work, he should add to his education as much as possible. It should at all times be remembered that the foreman holds his position of responsibility and authority because *he knows*—because he has learned to study and *apply his knowledge* to the daily problems that confront him in his work. Knowledge has given him self-reliance and confidence in himself and in his ability to do his work according to the demands of the company.

The foreman, as a groundman and lineman, put thought and care into his daily work, and at all times he kept one object in view—the job above him—and he eagerly seized and took advantage of every opportunity to increase the knowledge that would place him in that position.

This is what every man who wishes to advance himself must do. Of course if he wishes to remain a groundman or lineman all his life, then that is another story. But if he really desires to get ahead in his work and wishes a higher position in telephone work, he must apply these principles to his daily task. Application, with his eyes always on the work of the more skilled man above him, who is always willing to give him a helping hand to a higher and fuller knowledge of telephone construction, will rapidly lead to a substantially larger pay.

Unusual Cut-Out on Rural Telephones.

In one of your recent issues there appeared several illustrations of cut-outs used by farmers. While on an inspection



Cut-Out Found on a Farm Telephone.

tour, I came across one which I have never seen before and send you a rough sketch of it.

As shown in the diagram, a board was nailed to the limb of a tree which was about 10 feet from the residence. In order to cut-out the telephone, the pole is pushed up and the end of it placed on the block fastened to the trunk of the tree. The iron strip comes between the split end of the contact and makes connection. You will note that there is a fork on the limb and this pole works between the branches.

A. K. Kirkland, Manager,
Ash Grove, Mo. Ash Grove Telephone Co.

Railway Telephony—Practical Points in All Branches

A Regular Department Which Appears Semi-Monthly—Scope Includes Principles of Construction, Testing, Operation and Maintenance—Columns Open for Contributions on Matters of General Interest to Those Engaged in This Branch of Telephony

Efficiency in Operation of Telephone and Telegraph.*

By John H. Finley.

Phantom Circuits.

Fig. 12 shows double the number of wires not only furnishing double the number of circuits but also an additional circuit known as a "phantom" circuit. It is so called because no extra wires are used for its path, or rather since it travels in the same path at the same time as the other or "physical" circuits, thus almost proving the fallacy of the law that two things cannot occupy the same place at the same time. But in reality the two circuits do not occupy the same space at the same time. To illustrate this revert back for a moment to the description of the simplex circuit. There it will be noted that it is stated that between two points in a circuit having identically the same electrical characteristics, such as voltage, frequency, current, etc., no electrical changes can occur. It is on this principle that all phantom combinations as well as all simplex arrangements are built up.

In Fig. 12 it is to be noted wires *A* and *B*, and *C* and *D* are shown as duplex. On circuits *A* and *B*, a simplex telephone circuit is used, as is also the case with *C* and *D*. This does not, however, preclude the possibility of simplexing the pairs or putting on a phantom telephone. The straight composited system has been previously explained so it will not be discussed, but the phantom circuit may need a little further explanation as additional factors have been introduced.

For instance on wires *A*, *B*, *C* and *D*, the telegraph current may be traveling in either direction at any time but it will always be direct current. At the same time a high frequency, alternating current may be traveling over the circuit *A* and *B* and at the identical instant, another high frequency talking current may be traveling over the four circuits. It is to be noted that in this latter case, the voltage, frequency, current and in fact all characteristics of the latter circuit on wires *A* and *B* are the same at the same time and hence no flow of current can occur between the two circuits. The same reasoning also holds true for wires *C* and *D*. Therefore as long as an absolute balance can be maintained between the pairs of

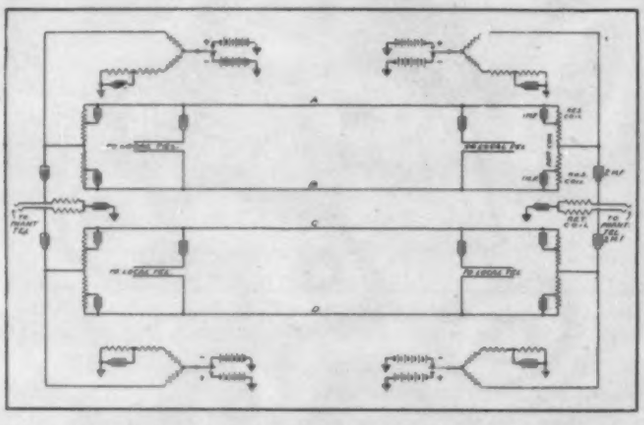


Fig. 12. Phantom Over Simplexed Physical Telephone Circuits.

wires over which the phantom works, it will not interfere with the telephones on the pairs nor with the duplex telegraph on each simplex. Again it is desired to more strictly than ever emphasize the necessity of keeping this balance in impedance, capacity resistance and leakage to ground if possible, as otherwise losses will occur and interference between the circuits will result.

This explanation covers the operation of a phantom circuit over a simplex. The same principles may be applied to composited lines as shown in Fig. 9, which appeared in the May 31 issue of Telephony.

Special Combination Circuits.

By keeping in mind the princples involved in the various circuits which have been discussed, it will be possible to secure

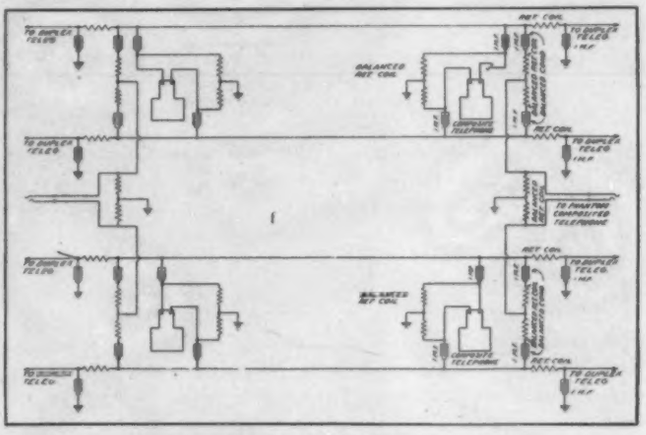


Fig. 13. Special Combination Circuit.

an almost innumerable number of combinations to produce almost any desired result.

One example, a reference to Mr. Bennett's paper read at Boston before the Association of Railway Telegraph Superintendents in 1910, will be sufficient to illustrate this. Fig. 13 illustrates the service which may be obtained from four wires. In this particular case, it was desired to secure the following service from the wires available between Evansville and Terre Haute, Ind.:

1. A train dispatcher's circuit.
2. A through simplex telegraph circuit.
3. A telephone block signal circuit.
4. A local message telegraph circuit.

In addition to these circuits, it was desired to place siding telephones at various points along the right of way. While they were to be normally connected to the block wires, they were to be so arranged that, when desired, communication could be had directly with the dispatcher. This communication, however, was to be under control of the dispatcher, as otherwise he could not arrange to handle the business required of him if interrupted by people at the siding stations. Hence it will be noted, Fig. 14, that each station is provided with a switch and the repeating coil is so arranged that it is possible for the operator at that station to cut in on the dispatcher's line a section of the block telephone circuit. On this line there were: 29 regular telephone dispatcher's stations; 35 siding telephones, and 28 local telegraph stations.

The local telegraph was carried through on a line from Terre Haute to Danville and was there put in on one leg of a quadruplex circuit to Chicago and the through telegraph circuit was also carried on to Chicago.

A number of different results could have been arranged for

*Continued from issue of May 31.

The Coal Trust Would Not Be A Bit Happy

if it was always summer. But the manufacturers of copper wire would be, because cold and copper make a bad combination.

That's why so many people are using No. 12 Copper Clad Steel Wire now instead of No. 10 copper.

Of course, a saving of fifty per cent has a little influence too.

A lineman can carry twice as much No. 12 Copper Clad as No. 10 copper—and a No. 12 Copper Clad can carry twice as much sleet as a No. 10 copper.

So the lineman *has* to carry twice as much No. 10 copper as No. 12 Copper Clad and so the lineman has to—

Oh, ask the lineman, he'd rather have the No. 12 Copper Clad summer or winter.

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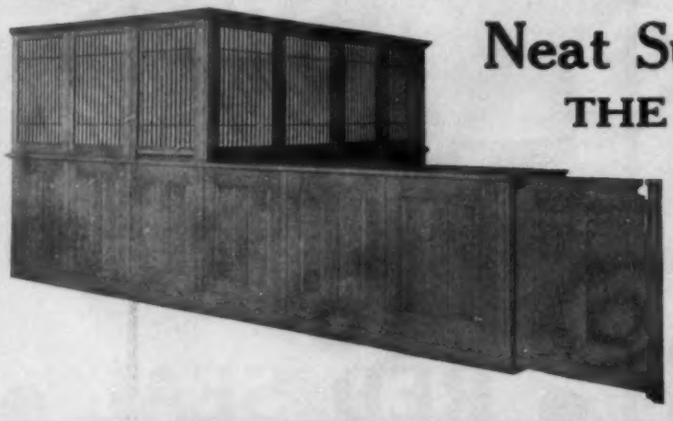

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if desired. Almost any number of combinations can be obtained by the application of these principles.

No one should stop short of the best and most efficient combination possible in these days when expert service can be very readily secured, both in furnishing data and maintaining the apparatus.

In the foregoing paragraphs has been shown some of the

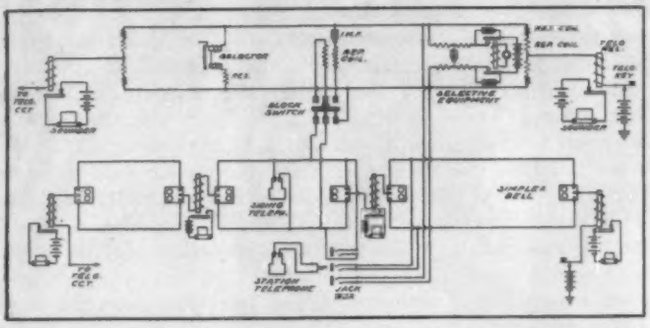


Fig. 14. Composite Phantom Over Composite Duplex, 11 Circuits.

methods used to economize in the use of wires and to render the efficiency of this part of the service somewhere near what it ought to be. The finer details of the line construction or office arrangements have not been described. It is sufficient to say that a uniform method of construction should be used, both in the offices and on the line, to facilitate the locating and clearing of trouble.

If some standard of construction were possible, it would be desirable. The use of one manufacturer's products is not necessarily any assurance of similarity of equipment from year to year. Like all other things in the world, to stick to standards often means to stand still in the race of life, and, in this particular industry which as everyone knows is just in its infancy, it would be folly to refuse to accept the latest improvements just to insure the use of some one firm's equipment.

Doubtless the railroad companies started out to adopt standards, but if any road should insist on absolute standards, they would hardly be able to keep to them in any line. The types of engines, rails, bridges, stations, cars and every detail of plant and rolling stock are changing from day to day. Economy demands that companies go forward with the times and use the latest of everything, if they want to save time and money in construction and operation.

(*To be concluded.*)

New General Telegraph Office of C., B. & Q., Chicago.

By J. A. Kick.

Telephone and telegraph installations employing up-to-date means and methods are of interest to the railway telegraph departments. In the new general office building of the Chicago, Burlington & Quincy railroad, corner of Jackson boulevard and Clinton street, Chicago, has been installed a general telegraph office which is one of the most complete offices of its kind in the country.

Working positions to the number of 64 are provided and these positions so arranged as to be advantageously grouped for highest efficiency during maximum and minimum load periods. Local wires are grouped and arranged on multiple jacks so that the operators may switch from one to another while remaining at any "local" position.

Positions for multiplex operation are arranged and used in through circuits, but are convertible for single line telegraph service.

Tables are arranged centrally located for handling business during the minimum load periods. These tables are of the convertible set type for the purpose of closely grouping the circuits at times when the operating force is small and one attendant is required to serve a large number of wires. Several telephone message circuits are operated and arrangements have been made for increasing the number of these positions.

The switchboard is one of simplicity and yet of completeness, in that every conceivable means for simplifying operation has been utilized. Apparently no detail of marking, numbering and standardizing has been overlooked. The result is one well worth str;iving for, rather than have the operating forces forever puzzling over an incomplete installation. It was accomplished by the designing engineer having carefully worked out these details.

Main frames and coil racks are provided and a power board installed where it is directly under the constant observation of the wire chief. The multiplex apparatus is of the latest type and installed on specially designed tables, providing means for mounting condensers, coils and resistance units on shelves underneath.

While the equipment is of course well known, the association and careful grouping for effectiveness is indicative of much study and should be of interest to those contemplating such installations.

One of the most important functions of a large telegraph office is the rapid delivery of telegrams. This plant has been equipped with a tube system which terminates in the telegraph office and serves as a means of distributing telegrams as well as a means of interchange between all offices of the building. The tubes and receiving counter are attended by a chief check boy and are under the constant supervision of the chief operator who is in charge of traffic.

Communications between different floors are routed via this tube system and are transferred at the telegraph office terminal by means of certain designations on the carriers. The tube system has decreased the number of messenger and check boys, while speeding up the service. The result is that the saving per annum must represent a fair return on the investment.

The Chicago, Burlington & Quincy railroad has recently installed at Galesburg, Ill., an office which, in effect, is an exact duplicate of the new Chicago office. When it is stated that 20-minute telegraph service is maintained on this system, the clockwork precision of its operating methods will be better understood.

These installations have been made under the direction of Superintendent of Telegraph V. T. Kissinger and his able corps of assistants.

Telephones for Train Dispatching in Canada.

The Canadian Pacific has installed telephone wires for train dispatching on its main line in British Columbia, and by the close of the present summer it is announced that train orders on all important western roads will be transmitted by telephone, says Telephone Talk. The wire to establish connection between Westminster Junction and New Westminster is on the ground and will be strung shortly, so that this branch line will also soon be included. The Canadian Pacific Railroad will string 4,775 miles of wire this year and 2,280 miles of track will be operated by telephone.

The Canadian Northern, now completing sections of its road in British Columbia, will start in with telephones for dispatching, and proposes to use this method exclusively.

Since telephoning is so convenient and effective, railway contractors on the line of the Grand Trunk Pacific in the northern interior have lines strung along the right-of-way, and soon Fort George will have telephone communication with Edmonton by means of these wires. As the railway is extended across British Columbia, the railway lines, until adopted for use in train dispatching, will give commercial communication from one side of the province to the other.

The Telephone Inspector and the Troubleman

Continuation of a Series of Articles Begun in the September 7 Issue of Telephony—They Deal in an Elementary and Explicit Manner With Many of the Problems Encountered by Telephone Men in the Operation of Small Exchanges

By A. E. Dobbs

"That man from Galeton," spoke up Will, "a while ago was telling me of running a ground wire two or three miles from the office in order to get away from some local disturbances. He grounded it in a swamp or a river bed, I don't remember which. Was that a good plan?"

"That might be a good thing in the case of a grounded toll line," replied George, "but I have doubts about it as regards a common return, for the reason that the earth potential, to which leakage from the return wire is exposed, and that of the ground wire, might be different enough to constitute quite a disturbing factor. Therefore I would rather risk a good ground at the office. I have also heard of some grounds in the beds of creeks that were not very satisfactory.

A Word as to Ground Wires.

"In some exchanges grounded lines are used instead of a common return, in these cases the lines are connected to gas pipes, water pipes, ground rods or even railroad tracks. Such a system, to be sure, is out of date, but we still find them in many places. I have already explained that there may be considerable electrical difference between various systems of piping, therefore they should all be connected to the office ground wire with a good electrical connection obtained by soldering or otherwise. This will do much to equalize the differences, besides giving the telephone instruments a direct connection with the office through the pipes. Be sure to use a ground wire not smaller than No. 10 B. & S. copper, and you will need a still larger one for connection to the lightning arresters. Lightning sometimes comes in strong enough to melt a No. 10 wire. For lightning, iron wire is as good a conductor as copper. Some authorities think it is even better.

"With a common return wire not grounded except at the office, the situation is different, because experience has proved that with trolley currents frisking around the piping of the town, it is better to avoid the pipes altogether. Put your ground plate several feet below them, in order to get below these surface disturbances. From the ground plate, run a rubber insulated wire, and keep it insulated all the way to the switchboard, in order to keep it free from surface contact. This wire should not be smaller than No. 6 B. & S. copper.

"If you can find an old well at least 25 feet deep, so much the better. Out in some country districts they ground in wells from 60 to 300 feet deep, which is better still. As to your ground plate, remember that the contact resistance decreases in proportion to surface exposed. Therefore, it follows that a sheet of copper three feet square, giving a surface exposure of 18 square feet, would be better than a heavy iron bar with less surface. I have spoken of copper, because it is almost the only metal that will not corrode sooner or later.

"It is sometimes thought well to surround the ground plate with coke, charcoal, tin cans, etc. This is of no special benefit, if you get down deep enough to insure a constant contact with wet earth. In the past few years a grounding cone consisting of fine charcoal enclosed in a cone of copper screen wire has been used with very satisfactory results. All this care may seem like a lot of trouble to go about on account of a ground wire, but results will justify it. The best way I have found to attach the wire to the ground plate is to strip the insulation back about eight inches, cleaning the wire carefully. Then I turn over the edge of the copper sheet around this wire and rivet it down, turning up a hook on the end of the wire, so that it can not pull out. This riveting is not so close but that the sheet forms a rather loose tube around the wire. Now take a blow torch, heat and fill the tube with solder, taking pains to see that the solder is thoroughly sweated in much the same way that electric light men would sweat on a lug terminal. In this way you secure a permanent connection and one that you can rely upon.

"I will say further that it is a poor plan to connect the line wire from one lead to the return wire of another, something like this (Fig. 79). In this case, three different leads are shown as following three streets. The telephone *T* was taken from the Archer street line, but it was more convenient to catch the return wire from Bacon street, which, of course, made the line noisy. In another case it was thought an advantage to connect the outer ends of all these return wires, as indicated by the dotted line. That was also a failure. Another time the return wire was grounded at the exchange, and the manager thought to make it still better by also grounding it at the outer end on the Case street branch, so as to get rid of induction from a trolley road. This had the effect of making his whole return system assist the trolley road in returning current to the power house. It is unnecessary to say that it was not satisfactory either. You will notice that the return for each one of these leads comes off one wire. It would be better to keep them separate, unless the place where they branch off is but a short distance from the office.

"Others have used the lead sheath of the cable as a return. This would be well enough, were it not for the fact that the sheath is nearly always grounded to the messenger wire. The grounds are so widely scattered, being indirectly connected to the different anchor slugs, that you might as well have a grounded system. One thing more, toll lines should not be run through the local cables. They should be kept separate, even to the switchboard, and in no way connected to the local board, except through repeating coils, unless they are full metallic. This also applies to the common return wire. In many cases metallic circuit equipment is used in the office and the circuits carried out full metallic to the outside cable boxes, where one side of each pair is connected to the common return.

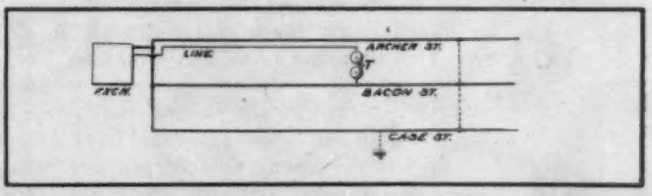
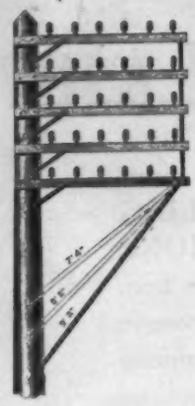
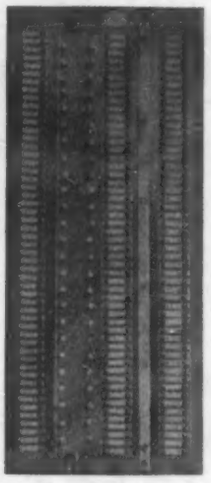


Fig. 79. A Poor Plan to Use on Common Return System.

Where this is not done, keep this wire out of the cables. If the return wire must be grounded, tap it near the center of the system. Do not ground it at the outer end or at any other place except near the exchange."



To Use is to Appreciate
The Security Line

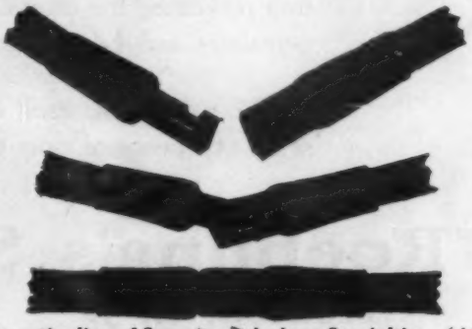


SECURITY CONDUIT RODS

The only rods that cannot buckle or uncouple in the duct. They couple and uncouple quickly and easily—"run" smoothly—are light—easily handled—and durable.

Security Alley Braces

Afford an inexpensive and efficient method of bracing side arms. They not only strengthen the line appreciably, but give it a firm, trim appearance. Readily attached to standing pole. Why not rejuvenate your crippled pole lines with Security Alley Braces?



Security Cross Connecting Panels

For small exchanges. Convenient, compact and inexpensive. All contacts mounted on hard rubber on front of board, not half on front and half on back, which makes for rapidity and greater advantage in handling. Cross connections from one panel to another easily made.

Write for information and prices on the entire line of Security Telephone Specialties. ***(ASK FOR BOOKLET NUMBER SIX.)***

The F. Bissell Company
TOLEDO, OHIO

Here Is Satisfactory Lightning Protection—

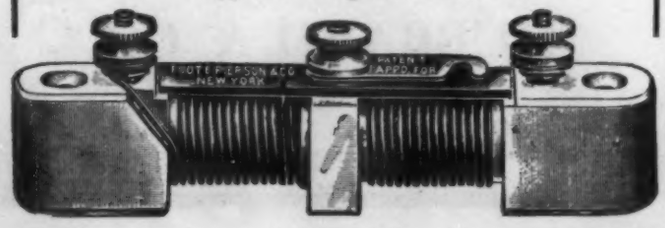
The sort of protection that may be relied upon during the most severe storm—protection that **costs least expense—and no worry or trouble in maintaining.**

The Argus Lightning Arrester

answers the lightning protection problem. It is maintaining service through heavy storms for many companies—it arrests and **causes no grounded circuits**—and **it's always in order.** Let us tell you more about it.

Foote-Pierson & Co.
160 Duane St., New York, N. Y.

Type "A" Argus Arrester



EXCLUSIVE

That's what the "VAC-M" is, when you're talking about real efficiency of lightning arresters.

Really, it's in a class all by itself, when it comes to the crucial test.

More sensitive to static disturbances than an air gap of $\frac{2}{1000}$ of an inch.

But—how many times can an air-gap arrester with such a small gap ($\frac{2}{1000}$") discharge without cleaning?

It is needless to tell you that the "VAC-M" never has to be cleaned.

You can find our arrester in the list of approved devices by the National Board of Fire Underwriters.

The National Electric Specialty Co.
TOLEDO, OHIO

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The Wire That Lasts

when exposed to the elements is one which resists the tendency to rapid corrosion. **ROEBLING DOUBLE GALVANIZED TELEPHONE WIRE** is such a wire because it is made from metal of good quality in such a way as to preserve a uniform structure. This causes the galvanizing to **hold and protect** when the wire is spliced thus preventing the cracks through which moisture percolates and brings rust.

The galvanizing itself is the best development of an experience of more than half a century.

John A. Roebling's Sons Co.

Trenton, N. J.

Warehouses: New York Chicago Philadelphia Pittsburgh Cleveland
Savannah, Office Atlanta San Francisco Los Angeles Seattle Portland, Ore.

Don't Dally with Danger

or painful injury, by trying to locate "trouble," handling wires or doing any electrical work or investigation unless your hands have adequate protection.

A heavy glove is not necessary. There's a wonderful new work glove that every lineman and electrical worker should know—the

Grinnell REZISTOL "Rist-Fit" Glove

made of leather, light, soft, smooth fitting, and very pliable, but tough as rawhide and without equal for long service. It will outwear two or three pairs of ordinary gloves.

"Rezistol" leather, subjected to a "High Voltage, break-down test" by a well known testing engineer did not puncture below 4,000 volts.

Why clumsy, costly, short-lived rubber, with its endless expense, when **Rezistol** Gloves may be had at almost any dealer's, at a very modest price?

Catalog on request, with a sample of "Rezistol" leather, and our "Pair-on-Approval" offer. WRITE!

Morrison-Ricker Mfg. Co.

Established 1856

133 Broad Street Grinnell, Iowa

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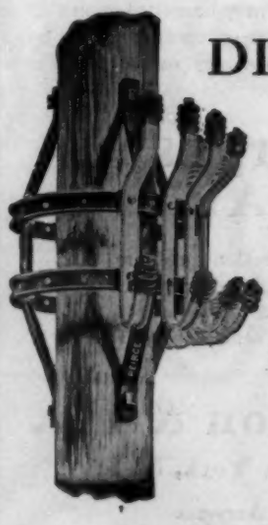
SMALL DISTRIBUTING CIRCLE



Constructed of channel steel—hot galvanized — will withstand most severe weather conditions—unlimited in service—and reasonable in price. Has capacity of 15 of No. 20 brackets, which can be attached as required.

Write for Catalog of Hubbard Supplies

"If it's a Peirce specialty it's right"

HUBBARD & CO.

PITTSBURGH

NEW YORK CHICAGO

Please tell the Advertiser you saw his Announcement in TELEPHONY.

OTHER TROUBLES.

One day a traveling telephone salesman with whom George was well acquainted, called and after exchanging greetings, they naturally began to swap stories.

"Do you know I have been put to an awful lot of bother by some of these small exchanges," remarked the salesman. "One day the house telegraphed me that a board which I had sold was in trouble, and ordered me to fix it. I traveled more than 60 miles to the place where it was installed, and what do you think I found?"

"Give it up."

"Well, sir, they had taken a notion to move their batteries to a different shelf from the one on which the installer had placed them. In connecting up the transmitter battery, they had connected the two zincs with each other, and the two copper terminals to the circuit. Of course, they could not use that transmitter. It meant 60 miles and back for five minutes' work for me.

"Only the other day one of our customers swore that there was a lot of cross talk on his board. When I went down there, I found that in several places he had connected in a dozen subscribers with No. 14 wire as a common return. All over town it was the same way, so of course, he had cross talk. But we did not build his exchange, we only sold him the board, and that was all right."

"It's queer what ideas some of those people have," commented George.

"I should say so," went on the traveling man. "At another place I was ordered to trace cross talk in a board, and I found the cable connection to the board wired with common annunciator wire, which passed through a wet cellar. Why, I could wring out the water with my hands. I simply spread those wires out and gave them a chance to dry and the cross talk disappeared.

"At another time I was sent out to look after the same complaint and found a case that kept me guessing for some time, as everything appeared to be all right. The cable to the cross-connecting rack was also annunciator wire, and on looking it over I found where some one had spilled muriatic acid over it while soldering the connections. No less than three cables were soaked in this way. Of course that board had to be rewired.

"But that's the way it goes, all the cross talk in an exchange is laid to the board. Now, I know that there is no cross talk in our board. The coils are wound to high resistance and are adapted to any kind of a system, common return or otherwise. But suppose we put in a board of that kind, and the owner puts in a lot of old junk telephones on his line, as I have known them to do, or possibly has a lot of damp cable, or has not a properly devised return system. You can't blame the board for the poor service, and yet the board is charged with it, half the time. I have experimented with coils on the work bench, thrown together in every conceivable manner, and I could not get cross talk through them, except to connect them in series, so I know the board is not at fault."

"About the only cross talk liable to be traced to the board is in a case where low wound coils are connected to a common return system," George volunteered, "and even that can be greatly helped by balancing the ringers and the common return to correspond. It is hard to entirely eliminate cross talk in a common return system."

(To be Continued.)

Telephones in Canada.

The total number of telephones in service in Canada, according to telephone statistics of the Dominion just issued, says Canadian Engineer, is 370,884, 212,732 common battery and 158,152 magneto. During 1912 there was an increase of 37,738 in the number of telephones operated by common battery, and an increase of 30,387 in the number operated by magneto. The total number of miles of wire is given as 889,572. This is divided into urban and rural as follows: Urban, 636,961; rural, 252,610. This indicates that there is one mile of telephone wire in use for every 8.1 of the total population of the Dominion, and one telephone for every 19.3. There was one telephone for every 2.3 miles of wire. The class of wire used was as follows: Galvanized, 271,191 miles; copper, 20,096; overhead cable, 232,393; underground cable, 364,875; submarine cable, 1,015. The aggregate capital expenditure in telephones is now placed at $46,276,851, though the cost of real property is placed at something over $10,000,000 beyond this figure. This works out to a capitalization of $124.75 per telephone in use. The gross earnings from all telephone companies for the year amounted to about $12,250,000, as compared with a little over $10,000,000 the previous year. Operating expenses were 74.0 per cent. of gross earnings as compared with 69.32 for the previous year. Gross earnings work out to $33.90 per telephone in use or $13.79 per mile of wire.

Eliminating Overhead Pole Lines from Panama.

At Colon, in the Canal Zone, the work of removing all poles and overhead wires from the thoroughfares is now in progress, says the Electrical World. All electric light and telephone wires of the Panama Railroad Co. are being placed in vitrified conduits. These conduits contain six ducts with 3.5 in. openings and are being incased in concrete to a thickness of 2 in. Four of the six ducts are designed to contain motor and lighting circuits; one is for the telephone cables, and the sixth is for possible future growth.

Manholes of sufficient size to facilitate the drawing in of cables were built of terra-cotta tile, concrete and cement. It was not found possible to keep these manholes free from seepage water from the sea, and hence openings were made in the sides of each manhole at the level of low tide to prevent the water from reaching the cables. Although the cables are waterproofed, it was thought that their contact with salt water and cement might create a local chemical action that would tend to injure them. Smaller ducts are being laid to outlying points for carrying 25-cycle energy to electrically operated sewer pumps and similar apparatus.

Telephones in New York.

The number of telephones in New York has passed the half million mark which gives that city almost as many telephones as may be found in three principal foreign capitals—235,000 in London, 210,000 in Berlin, and 92,000 in Paris.

Italy's Queens Obtain Privilege of Marriage for Operators.

Through the influence of Queen Elena and Dowager Queen Margherita, the bane against married women as telephone operators has been removed. A law, enacted in 1906, providing that telephone girls in the government service must not marry between the ages of 18 and 25, has been repealed. The new act provides that married operators shall have clerical positions when their husbands are not earning much or when they are sick.

Immediately upon the passage of the law forbidding marriage to operators, the girls in all the large cities organized in defense of their romantic rights. Two years ago, on the eve of a threatened strike, the minister for posts and telegraphs promised to appoint a scientific committee to settle the matter.

The commission was so slow that the girls recently appealed to the queen and the queen mother, setting forth that Italy is the only nation in the world which deprives a portion of its women population of the right to complete happiness. The two queens showed immediate sympathy and, conferring with the wives of the statesmen, formed an invincible force that carried king and parliament before it.

From Factory and Salesroom

Convention: Mississippi Independent Telephone Association, Corinth, June 17, 18

New Midget Ammeter and Voltmeter.

The Keystone Electrical Instrument Co., of Philadelphia, Pa., has been perfecting for the past year a midget ammeter and voltmeter three inches in diameter of the highest grade for use on switchboards, automobile dashboards, and for portable service where a small instrument is particularly desirable.

In bringing out these instruments the endeavor has been made to reduce the number of parts required in the standard d'Arsonval system to a minmum. It is a well known fact that the d'Arsonval principle is the most accurate for direct current measurements, and in order to reduce the cost of these small instruments, and at the same time produce a high grade accurate instrument, much study has been given to this feature.

Of the accompanying illustrations, Fig. 1 shows the front of the board type Keystone ammeter, and Fig. 2 the instrument with cover removed. The simplicity of construction will be evident at a glance. A tungsten steel magnet of unusually large size is used so that permanency can be secured, and to increase the dead beat operation of the instrument. This magnet has no pole pieces, the poles being accurately ground. This does away with the magnetic joint between the magnet and the pole pieces, and also increases the magnetic strength. The bases are of moulded material to insulate the studs carrying the current through the switchboard or dashboard, and this material is also used so that the magnetic strength may be unaffected. To obtain the greatest strength from the magnets the covers are also formed of brass instead of iron. All holes in the covers and bases are square so there is no possibility of any of the parts turning when tightened up.

The aluminum coil form, seven-thousandths of an inch in thickness, on which the fine enameled wire is wound, swings in sapphire jewels between the poles of the magnet. The pointer is of aluminum tubing twelve-thousandths of an inch in outside diameter and with a wall one thousandth of an inch thick, and the whole moving element weighs only slightly over one-tenth of a gram, or the weight of one common pin. With a moving element so exceedingly light as this the instrument is absolutely dead beat in operation, and the pointer does not oscillate, although the instrument is subject to severe vibration. This exceedingly light moving element also has the advantage that there is practically no weight whatsoever on the pivots and bearings, assuring long life for the instrument.

The scale is white enameled on brass except where the black scales with white letters are preferred. Each instrument is equipped with a zero adjusting device by means of which the pointer can be readjusted to zero at any time from the outside of the case.

In Fig. 3 is shown the flush type instrument 3¼ inches outside diameter, and in Fig. 4 the portable type. The instruments have a scale 2¼ inches long, as shown in Fig. 5, which affords a clear legible scale for easy reading.

The Keystone Electrical Instrument Co. has for the past 18 years been manufacturing high grade ammeters and voltmeters, and it naturally has excellent facilities for designing, assembling and calibrating instruments of this character. It has been on account of the design of the instrument with such a small number of parts, and on account of the large quantity in which it is possible to manufacture them, that it is possible to produce a high grade instrument at low cost.

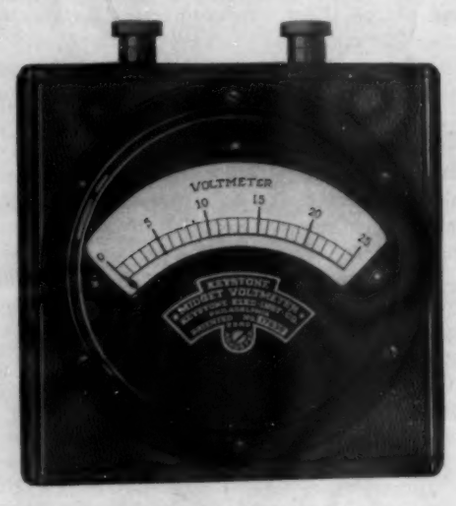


Fig. 4. Keystone Portable Voltmeter.

This new Keystone instrument is of particularly attractive appearance. It is furnished in either a dull rubber finish or full nickel plate, and the instrument will prove of particular interest where a high grade instrument of small size is desired, and the accuracy of which can be relied upon.

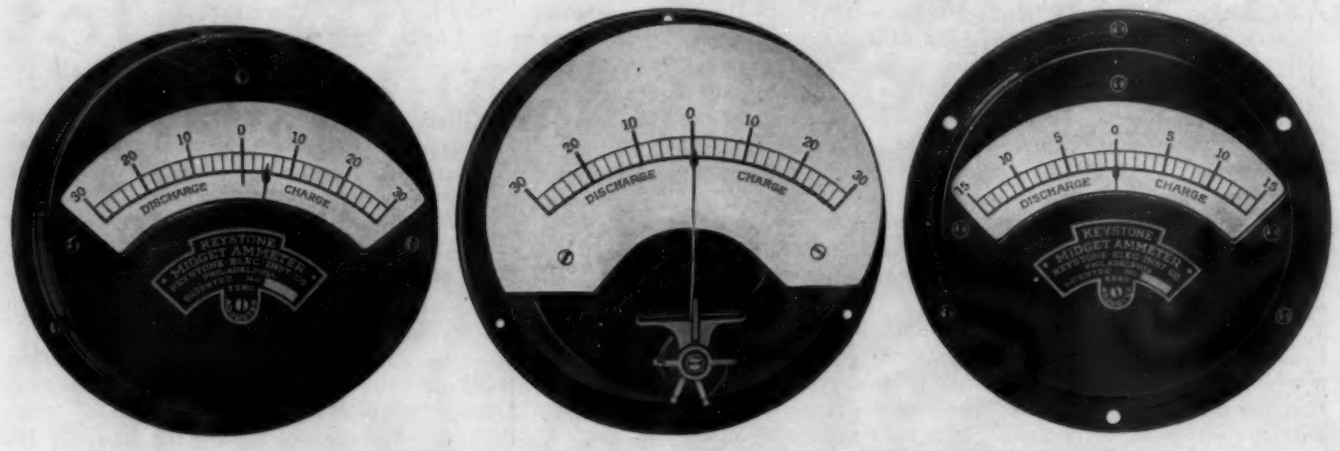


Fig. 1. Board Type of Keystone Ammeter—Fig. 2. With Cover Removed—Fig. 3. Flush Type of Ammeter.

Western Electric Secures American Automatic Patents.

A. F. Vance, jr., and C. H. Marvin, who, as representatives of the bondholders of the American Automatic Telephone Co., of Urbana, Ohio, purchased the plant and patents of that

Idaho Red Cedar **Poles**

Sandpoint Lumber & Pole Co., Ltd.

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Large Stocks—Prompt Shipments
Good Quality—Right Prices

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"Service—
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We **are now** distributors of both Western Red Cedar and Northern White Cedar Poles.

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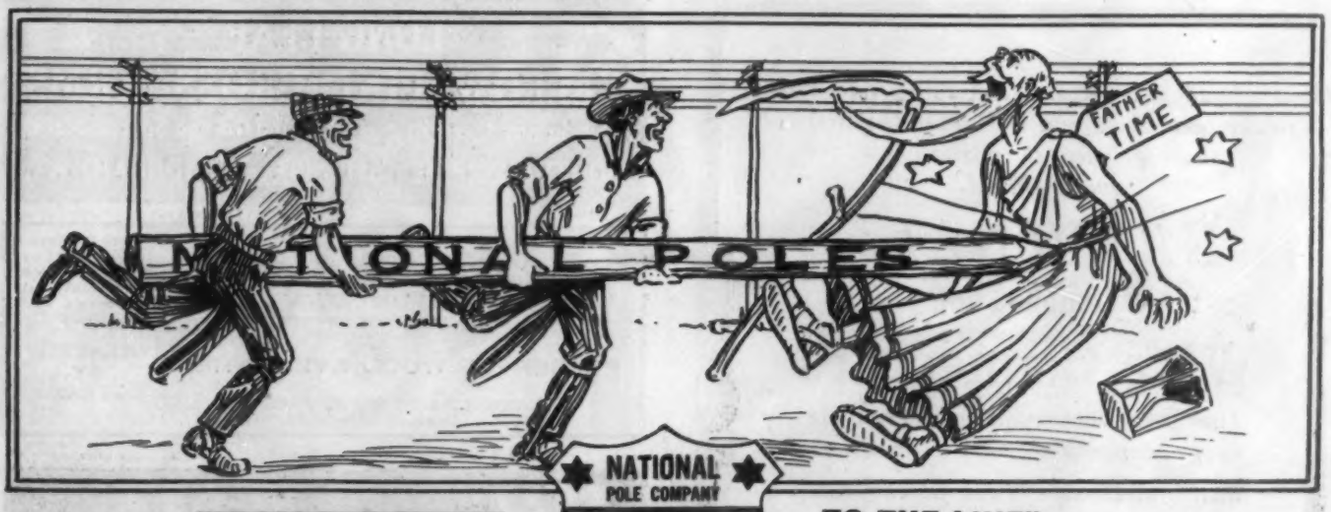

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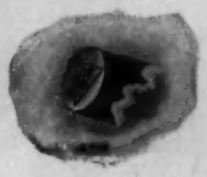
ESCANABA, MICH.
CEDAR POLES

Very Few Systems Employ Flimsy Construction any more. The Better the Company, the Better Its Methods. We are Able to Fill the Most Exacting Requirements of the Very Best Companies.

Over fifteen years of experience in WHITE and WESTERN CEDAR POLES
Exceptional Facilities. Yards at the Most Favorable Shipping Points.

National Pole Co., Escanaba, Mich.



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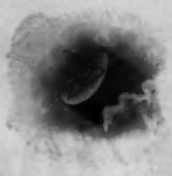

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Write for Quotations on any Quantity

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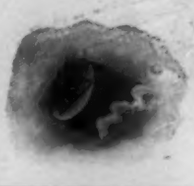

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How about Wire Connectors? You can never tell when you will need them—the safe plan is to always have on hand

NATIONAL
Double Tube
Wire Connectors

They make wire repairing and splicing easy—dependable and economical.

National Double Tube Connectors form practically a welded joint—a moisture proof, rust proof joint. They prevent high resistance joints and solder is unnecessary.

Use tinned copper and tinned iron sleeves for iron wire.

Let us send you prices and literature today.

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Warehouses: Brookport Ill. LONG LEAF Mills: Corinth and Ripley, Miss.
YELLOW PINE CROSS ARMS
Ship in any Quantity. Standard and Special Sizes.
SOUTHERN PINE MFG. CO., PADUCAH, KY.

Avenarius CARBOLINEUM REGISTERED
Most concentrated oil for brush or open tank treatment of poles and cross arms
PRESERVES WOOD EVERYWHERE
TESTED BY TIME
CARBOLINEUM WOOD PRESERVING CO.
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W. C. STERLING & SON CO.
POLES OF STERLING QUALITY
Oldest Cedar Pole Firm in Business
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A Cool Telephone Booth

The Hot, Stuffy Booth is no longer necessary.

Booths cooled by Sturtevant Ventilation please the user and **increase tolls** for the Telephone Companies.

Sturtevant
(REG. U. S. PAT. OFF.)

ELECTRIC TELEPHONE BOOTH VENTILATOR

This little electric multivane ventilator keeps the booth flooded with fresh pure air, free from drafts.

It does its work quietly, without in anyway impairing the sound-proof qualities of the booth.

The sets are complete in every detail, and are very easy to install. The operating expense is very small.

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And all principal Cities of the World
Also distributed by

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Your sanction is necessary to make *universal* the approval of the GOTTSCHALK TRANSMITTER

PROGRESS demands acceptance—and it is only a question of time before you will heartily endorse this highly efficient transmitter.

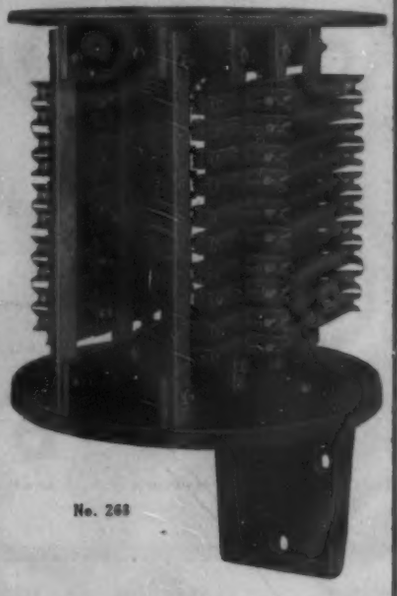
The Gottschalk transmitter is sanitary—has no flaring mouthpiece—no exposed mechanism. The cell is securely sealed in an air and watertight compartment and cannot deteriorate.

Its sturdiness, durability and freedom from breakage add materially to the "dollar and cents" side of the transmitter question.

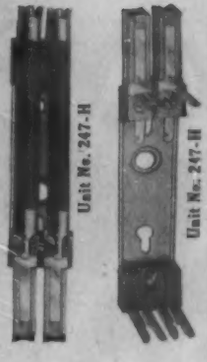
Correspondence solicited.

Gottschalk Waterproof Sanitary Transmitter Company
160 Broadway New York, N. Y.

THE Lafayette Electric & Mfg. Company, of Lafayette, Indiana, is a Co-operative Company, and lends its resources, its immense shop facilities, engineering department, sales department, clerks, offices, etc., to new and to old customers. Why not be a customer of this company? We are glad to quote on large or small quantities.



We make several different types of Can Top Terminals. This shows our No. 268 Terminal, being a unit fuse terminal. The protector unit used is either a tubular fuse and carbon No. 247-H, or tubular fuse No. 246-H. This type of protector has a specially long 5½ inch tubular fuse and its holding springs are so designed that they are adaptable to fuses of other manufacture. This fuse mount has been especially designed for the benefit of companies that desire the "Sterling" individual fuse mount terminal, but have many times refrained from their adoption on account of the inconvenience of the new fuses being of different size than their old ones for terminals of other manufacture. The No. 268 terminal eliminates the disadvantage and makes possible the use of our unit type terminal with fuses interchangeable with those of terminals of other manufacture previously in use. This terminal is made in sizes of from 10 to 60 pairs.



The dimension of the cans for the various sizes of the No. 268 are as follows:

	Diameter	Height
10 pair	9⅛ in.	9¼ in.
15 pair	9⅛ in.	13⅜ in.
20 pair	9⅛ in.	15¾ in.
25 pair	9⅛ in.	19⅜ in.
30 pair	9⅛ in.	21⅞ in.
40 pair	9⅛ in.	28 in.
50 pair	9⅛ in.	34 in.

MANUFACTURED AND SOLD BY

Lafayette Electric & Mfg. Co.
LAFAYETTE, IND.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

—"We will start on that job tomorrow—the supplies will be here." They are coming the

"*Illinois Way*"

You may depend upon receiving them on time—carefully packed, latest stocks; your shipment exactly as you ordered it—*ready for immediate action*

Our service system has enabled thousands of managers to plan *definitely* and speak *decisively*. Delayed shipments—poor stocks, damaged, missing or wrong goods—are expensive, annoying, disgusting.

They are the results of *poor* supply service that prevent *your* giving *good* service.

Why not be confident of a satisfactory supply system? —you'll surely appreciate its many advantages—why not give us an opportunity to show you that the "Illinois Way" is all that is said of it—dependable, highly satisfactory and economical.

Have you a catalog?

ILLINOIS ELECTRIC CO., 308 W. Madison Street, CHICAGO, ILLINOIS

B&K

At 15,260 Pounds the Strand Broke—the Clamp Was Unharmed.

B & K Guy Clamp

attached to a 7 strand crucible steel guy rope, and tested under a Reihle Tensile Strength Testing Machine, proved conclusively its strength and durability. The B & K guy clamp is the **new way—the best way—the most economical way** to clamp your guy ropes.

Let us tell you more about it. A B & K Catalog on request.

BARNES & KOBERT MFG. COMPANY

New Haven, Conn.

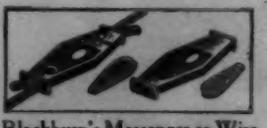
Some Advantages of

BLACKBURN'S Boltless Guy Clamps

Blackburn's *Boltless* Guy Clamp

Blackburn's *Boltless* Pole Clamp

Blackburn's *Boltless* Twin Guy Clamp



Blackburn's Messenger or Wire Splicer

Guy Clamps do not require thimble—quickly and easily installed. Hold strand absolutely rigid—do not injure strand—and prevent its slipping.

Only 3 parts to Blackburn's Boltless Guy Clamps. They save 3 to 4 feet of guy wire. Let us tell you more about these clamps—***they mean money in your pocket.***

Everstick Anchor Co.

ST. LOUIS, MO.

company at receiver's sale on May 1, have engineered a deal for the sale of the patents to the Bell telephone company and the patents will be taken over, it is said, by the Western Electric Co.

The price paid by the bondholders for the American Automatic Telephone Co.'s entire holdings was $110,000 and the amount now realized on the patents alone is $75,000. The bondholders still own the factory and equipment, which are said to be worth from $70,000 to $80,000. General Counsel Tanner of the Bell company recently visited Urbana to investigate the automatic company and the patents, and is said to have made a report favorable to the consumation of the sale.

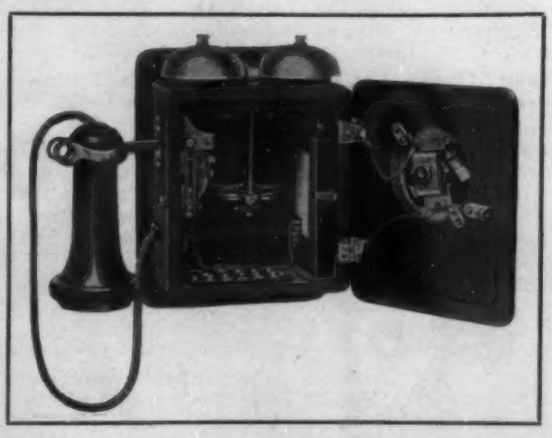
A New Residence Telephone.

There are fashions in telephones as well as in furniture and decorations in the modern home. How out-of-place the wall telephone of about five years ago with all of its "ginger bread work" would look nowadays. Efficiency and simplicity are the present key words in telephone manufacturing, and the accompanying illustration exemplifies

Exterior View of Residence Type Telephone Set.

the Stromberg-Carlson Co.'s application of these basic ideas.

The views of this new No. 1126 type residence telephone illustrate the compact arrangement of the instrument. Every part is removable as a unit without disturbing any of the adjacent parts or their wiring. All connections, with the



View of Interior of Set.

exception of the receiver and transmitter cords, are carried in a single hand-formed cable, which is color coded to facilitate the tracing of the circuits. To further assist the installation work a properly labeled terminal strip of ample size is provided in the bottom of the telephone.

Instruments of this type are now being carried in stock with all standard equipments for service as straight line, four-party harmonic or convertible subscribers' sets. The latter equipment is particularly advantageous, as the only change necessary to convert the instrument from a straight line station to a party line set, or vice versa, is substitution of the ringer armature movement. This type can also be furnished with "series" equipment employing a direct current receiver with the induction coil omitted.

An attractive booklet descriptive of this and other new types of common battery telephones has been prepared and can be had upon application to any office of the Stromberg-Carlson Telephone Mfg. Co.

Paragraphs.

Wesco Supply Co., St. Louis, Mo., announces that F. D. Phillips, formerly city sales manager, has been appointed general sales manager of the company.

Union Electric Co., Pittsburgh, Pa., is distributing a new 56-page discount sheet applying to its No. 6 electrical supply catalog.

Rome Wire Co., Rome, N. Y., has issued an attractive June calendar containing a reproduction of a painting by Brett entitled "On the Fence."

The Leeds & Northrup Co., of Philadelphia, Pa., which manufactures and deals in electrical and scientific instruments, is sending out a folder the outside cover of which is a halftone reproduction of the full size, of its type S portable Wheatstone bridge testing set. This set is 7⅜ ins. by 8¾ ins. by 4½ ins. in size and weighs eight pounds. A splendid view of the set with the cover lifted is shown on the inside of the folder.

W. N. Matthews & Brother, St. Louis, Mo., are sending out some interesting literature concerning the Matthews telefault, including a fac-simile letter from the Brevard County Telephone Co., Indianola, Fla., showing how punctures made by sharks and sawfish in a lead encased cable laid on the bottom of the Indian river are quickly and accurately located by means of the Telefault.

In the tests of the telefault, as described in last week's issue of Telephony, the set used for comparative purposes was of the type operating from a Rhumkorff coil.

Smith & Hemenway Co., 150-152 Chambers street, New York City, announces that instead of carrying stock in two places, arrangement has been made to carry at the factory, Irvington Mfg. Co., 130 Coit street, Irvington, N. J., a complete stock, and all shipments will be made from the Irvington Mfg. Co. after July 10.

This enterprise is a movement in the direction of facilitating shipment to customers and making more prompt delivery. Also, the company has largely increased the facilities of the factory and stock room to take care of additional stock and of the increasing business. This company manufactures the largest line of hand tools made in the United States, and owns the well known trade mark, the Genuine "Red Devil."

E. G. Chamberlain, president of the Southern Exchange Co. of New York, was a visitor at Telephony's office this week, and reported a big demand for poles in all parts of the country. His company operates in the Carolinas and Georgia, and is enjoying a most prosperous season. President Chamberlain is an enthusiastic believer in a brilliant commercial future for the South and expects a wide telephone development in that part of the country in the next few years. "We only wish we could produce more cedar than we are doing," said he, "as there is no difficulty in selling it."

New Telephone System for Denver & Rio Grande.

The Denver & Rio Grande Railroad Co. will install a telephone system from Ogden, Utah, to Grand Junction, Colo., 328 miles, for use in transacting railroad business in conjunction with the telegraph service.

Condensed News Reports

Officers of Companies are Earnestly Requested to Forward Us Promptly All Financial and Other Statements as Soon as Issued, and Any Items of Interest as to Their Plants and Systems

Personals.

HENRY P. STEADMAN recently resigned his position as manager for the Inter-State Independent Telephone & Telegraph Co. at Wilmington, Ill.

W. J. RHEINFRANK has assumed the position as local manager of the Central Union Telephone Co.'s properties at Esmond, N. D., Mr. Erisksen having resigned.

LLYOD MEDLAR, of Prophetstown, has been appointed manager for the Inter-State Independent Telephone Co., at Morrison, Ill., to succeed Glenn Stanners, resigned.

W. C. STROTHER, formerly in the contract department of the Cumberland Telephone & Telegraph Co., has been appointed assistant manager of the company, at Nashville, Tenn.

J. H. GILLVRAY has resigned his position as manager for the Mountain States Telephone & Telegraph Co., at Park City, Utah. James Barta, of Salt Lake City, will succeed him at Park City.

J. F. LANE, for the past year manager of the Wayne (Neb.) exchange of the Nebraska Telephone Co., has been promoted to the position of assistant commercial manager for Northeast Nebraska.

CHAS. A. CARL has been appointed general manager of the United Telephone & Telegraph Co., of Harrisburg, Pa., by the receiver who was appointed to take charge of the company's affairs.

E. O. TURNER, who has been manager for the Illinois Telephone Co. at Roodhouse, Ill., has resigned to become general manager of the properties of the White Hall Ice & Coal Co., in which he is interested.

C. L. BAER has been appointed operating manager for the Cumberland Valley Telephone Co., at Harrisburg, Pa., by the receivers who were placed in charge of the company by the United States District Court.

J. W. CREWS, division manager for the Chesapeake & Potomac Telephone Co., in Virginia, has been elected vice-president of the company and placed in charge of the company business in that state. C. R. Weber, of Baltimore, Md., has been appointed division manager to succeed Mr. Crews.

E. A. SMITH, district commercial manager for the Southern New England Telephone Co., at Hartford, Conn., has been chosen as successor to Wm. F. Harper, district commercial manager of the Waterbury district, who died recently as the result of injuries sustained in a trolley wreck. Mr. Smith will have charge of both the Hartford and Waterbury districts.

Obituary.

GEORGE E. BETTS, manager of the Southern New England Telephone Co., died recently at Bridgeport, Conn., at the age of 74. Mr. Betts was a member of the Telephone Pioneers of America. He entered the telephone service in 1878 and was dean of the telephone managers of that company, at the time of his death.

C. O. HARRIS, well known in the telephone industry, died on June 10, at Los Angeles, Cal., after a considerable period of illness. Mr. Harris started in the telephone business with the Bell telephone company at Buffalo about 24 to 26 years ago in the service, or repair, department. He left in 1900 to go with the Rochester Telephone Co., and was the office manager of that company until 1904, when he entered the sales department of the Stromberg-Carlson Telephone Mfg. Co., at Chicago. A year later he went to Salt Lake as manager of the Utah Independent Telephone Co. and remained there until his health failed and he became blind. He then removed to Anthony, Idaho, where, with the assistance of his wife, he managed a small exchange until the company was sold to the Bell. He removed to Los Angeles, Calif., about six or eight months ago.

New Companies and New Incorporations.

ANNISTON, ALA.—The White Plains Telephone Co. has been organized by the farmers of this vicinity.

HILL CITY, IDAHO.—The Hill City Telephone Co. has been incorporated with $5,000 capital stock to erect 50 miles of line. The incorporators are: A. C. Chipman, R. E. Mickelwait, Jim Howk, Wallace Powers, Grant Harrison, E. R. Rice, H. F. McCollister, John S. Harrison, Grant Starbuck, J. P. Mosier, Fred Burnet, Fred Haag, Will Kendall, W. H. Humphrey, G. W. Gill, Russell Higgs, W. K. Cleek, David E. Wilkins, John Harrison, Cap Homer, A. Miller, Marvin Mink and Harrison Bros.

HILLSBORO, IND.—Articles of incorporation have been filed by the Merchants & Farmers Telephone Co. with $10,000 capital stock. The incorporators are: J. B. Short, W. M. Lyon, J. D. Linville, J. A. Wilt and Jesse Brant, all of Hillsboro.

ST. JOHN, KANS.—The Rose Valley Mutual Telephone Co. has been organized with $300 capital stock. The incorporators are: R. W. Goodman, W. W. Adams, J. W. Shoop, S. E. McCandless, F. Marness, N. C. Adams, J. G. Adams and A. A. Shoop, all of St. John.

CRANSTON, KY.—The North Fork Telephone Co. has been incorporated with $1,000 capital stock. The incorporators are: A. L. Tacket, E. F. Reed and T. H. Caudill.

HILDA, KY.—The Hilda Telephone Co. has been incorporated with $1,000 capital stock by A. S. Caudill, O. S. Caudill and C. A. Jackson.

BANGOR, MAINE.—The Blue Mountain Telephone & Telegraph Co. has recently been organized to operate in this vicinity. C. H. Klauder is general superintendent and manager.

BOSTON, MASS.—The Boston Telephone Herald Syndicate has been incorporated with $5,000 capital stock. The directors and officers are: President, L. DeDoory, Boston; treasurer, J. M. Grosvenor, Jr., Old South Bldg., Boston, and J. W. Morton, of Boston.

ENFIELD, MINN.—Articles of incorporation have been filed by the Monticello Silver Creek Telephone Co. with $25,000 capital stock. Officers have been elected as follows: President, C. P. Weston, of Enfield; vice-president, Chas. Arvidson, of Monticello; secretary, S. A. Soderstrom, of Enfield; treasurer, Chas. Anderson, of Enfield.

HERMAN, NEB.—At its annual meeting held recently, the Herman Telephone Co. reorganized and was incorporated with $10,000 capital stock, $6,000 of which has already been paid in. A dividend of $10 per share was declared and the following officers comprise the managing board: President, Charles Nelson; vice-president, George Loftis; secretary, C. R. Gray and George Hart.

LUNDS VALLEY, N. D.—The Farmers Mutual Telephone Co. has been incorporated with $25,000 capital stock. The incorporators are: N. G. Evans, Andrew Roise and Lars Enerson.

BROWNSVILLE, OHIO.—The Tartar-Logan Telephone Co. has been incorporated with $3,000 capital stock. The incorporators are C. N. Tarter, D. A. Logan and Bertha Tarter.

GUTHRIE, OKLA.—The Guthrie-Southwestern Telephone Co. has been incorporated with $200 capital stock by W. N. Kellogg, C. P. James and L. J. Hirzel.

AURORA, ORE.—The Aurora Mutual Telephone Co. has been organized and the following officers have been elected: President, George A. Ehlen; vice-president, George X. Gooding; secretary, Adam J. Mishler; treasurer, Charles A. Becke, Jr. The directors, in addition to the above officers, are L. P. Swan, F. E. Yergen and J. P. Feller.

PARADISE, ORE.—Articles of incorporation have been filed by the Paradise Telephone Co., Ltd., capital stock of $2,000. The incorporators are W. J. Buch, I. E. Bodmer, O. L. Berland, J. D. Broughton and O. Stubblefield, all of this city

JAMESTOWN, PA.—Articles of incorporation have been filed by the Northwestern Mercer Telephone Co. with $5,000 capital stock. The directors are as follows: T. F. Bean, W. H. Floch, H. W. Brenner and Lee McArtman. W. A. McMaster is treasurer of the company.

VERMILION, S. D.—The Spirit Mound Telephone Co. has been incorporated with $4,000 capital stock. The incorporators are: Peter C. Cleland, Thomas Jones and A. C. McDonald, all of this city.

LIVINGSTON, TENN.—Articles of incorporation have been filed by the Oakley Branch Home Telephone Co. with $1,000 capital stock. The incorporators are: J. M. Billings, G. V. Grimsley, T. C. Young, M. M. Seevage and N. F. Nation.

AMERICAN STEEL & WIRE COMPANY'S W & M TELEPHONE WIRE

Small River Crossing using the "A" Fixture

OUR W. & M. Telephone Wire is drawn from metal made especially for the purpose and rigidly inspected. The spelter is carefully laid on with uniform thickness, ensuring ample protection for the wire under extreme weather conditions.

In point of conductivity this good wire has attained the highest possibilities and we submit our three brands—"E. B. B." "B. B." and "Steel" as the best that can be produced.

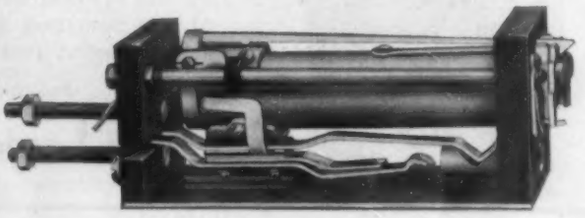
"W. & M. Telephone Wire News," a publication describing telephone wire in practical use, furnished free upon application.

Chicago **New York** **Cleveland**
Worcester **Pittsburgh** **Denver**

Export Representative: U. S. Steel Products Co., New York.
Pacific Coast Representative: U. S. Steel Products Co., San Francisco.
Los Angeles, Portland, Seattle.

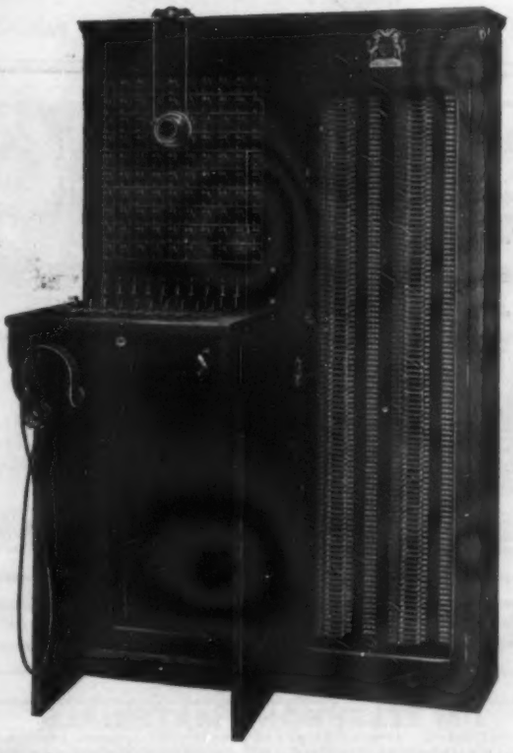
The True Reason

is clearly told in No. 31 catalogue. If you want a switchboard, you want the BEST switchboard.



There is but one SWEDISH-AMERICAN self-restoring, self-contained drop and jack. Notice the long, substantial jack sleeve which forms no part of the circuit; heavy German silver springs; removable coil from the front of the drop without loosening a screw or unsoldering a wire; positive night bell; double wound ring-off drops with condenser in each cord circuit; listening and ringing keys with contact points at the bottom, and every part constructed with a view to

Simplicity Economy Satisfaction



It is used by the Canadian Government and by thousands of Exchange and Long Distance telephone companies throughout the United States.

Be guided by the experience of experts. Ask for our picture book showing photographs of satisfied users.

Convince yourself—a postal card will do it.

Swedish-American Telephone Mfg. Co.
5235 E. Ravenswood Park Chicago

A New Type of Portable D'Arsonval Galvanometer

Sensitivity—1 megohm. **Resistance**—about 225 ohms. **Period**—about 2.5 seconds.

A suspended D'Arsonval galvanometer—so rugged that it will withstand more rough usage than an ordinary voltmeter.

The moving system is contained in a separate unit which is easily removable. Should the system become damaged due to excessive jars, this unit may be removed and returned to us by mail; weight, 4 ounces. Repairs will be made within one day of receipt.

Bulletin No. 232 describes this instrument. Ask for a copy

The Leeds & Northrup Co. ELECTRICAL MEASURING INSTRUMENTS
4904 Stenton Avenue, Philadelphia

McMeen and Miller
(Incorporated)
Samuel G. McMeen Kempster B. Miller Leigh S. Keith
Electrical and Mechanical Engineers
1454 Monadnock Block :: :: CHICAGO

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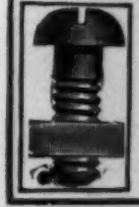
Attorney at Law
Practice includes representation before the Interstate Commerce Commission
SOLICITOR OF PATENTS
OFFICE: McLACHLEN BUILDING, WASHINGTON, D. C.

Construction Engineers
Does 32 years' experience mean anything to you? We have built some of the largest telephone exchanges now in operation. We also overhaul exchanges. Cable construction a specialty.
Will you allow us to estimate?
GEO. H. GLASS & COMPANY Pekin, Ill.

D. C. & WM. B. JACKSON
CHICAGO Harris Trust Bldg. ENGINEERS BOSTON 248 Boylston St.
Plans, Specifications, Supervision of Construction
General Superintendence and Management
Examinations and Reports
Financial Investigations and Rate Adjustments

The Bierce Anchor
One solid piece. Will not creep.
When the best is also the cheapest.
Where is the argument?
Let's get acquainted.
The Specialty Device Co.
CINCINNATI, OHIO

The Lloyd-Thomas Co.
RECOGNIZED AUTHORITIES ON PHYSICAL VALUES
APPRAISERS ENGINEERS
Public Utility Appraisal a Specialty
Chicago, 4727-4737 Evanston Ave. New York, 27 Williams St.



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Of every description for telephone construction. Besides we make screws, nuts and pole line hardware. Hot or cold galvanizing. Prompt shipments. Write mentioning *TELEPHONY*.
ROCKFORD BOLT CO., 20 RUBY STREET ROCKFORD, ILL.

CEDAR POLES Prompt Shipments Write for Prices
TORREY CEDAR CO., Clintonville, Wis.

The Most Satisfactory Medium in the World
—for advertising Poles, Cross Arms, Pins, Brackets, Preservatives, or any other item employed in Telephone construction work, is
TELEPHONY

J-M TELEPHONE MATERIALS
J-M Fibre Conduit. "Noark" Fuses and Fuse Devices, Jomanco Friction Tape, J-M Phoenix Splicing Compound, J-M Guy Anchors, J-M Asbestos Roofing, J-M Transite Ebony Asbestos Wood.
H. W. JOHNS-MANVILLE CO. New York and every large city

Vulcanized Fibre Special Shapes
Machined to Exact Gauge
Vulcanized Fibre in Sheets, Rods and Tubes
BAKELITE-DILECTO—High Efficeency, Water Resisting FIBRE
THE CONTINENTAL FIBRE COMPANY
CHICAGO, McCormick Bldg. NEWARK, DEL. NEW YORK, Woolworth Bldg.

STAY BINDINGS
Made and carried in stock in all sizes, Nos. 2 to 24 inclusive. Furnished in any color desired.
THE M. W. DUNTON CO.
Providence, R. I.

Please tell the Advertiser you saw his Announcement in TELEPHONY.

SEATTLE, WASH.—Articles of incorporation have been filed by the Universal High-Power Telephone Co. with $1,000 capital stock. The incorporators are: R. H. Singleton, E. E. Lutz and J. S. Bushnell, all of Seattle.

DANCY, WIS.—The Dancy Telephone Co. has been incorporated with $2,000 capital stock. The incorporators are: M. H. Stenburg, Gustave Borth, Sr., and John Marchel.

ELCHO, WIS.—The Elcho Telephone Co. has been organized with $1,000 capital stock. The incorporators are: C. W. Fish, of Elcho; E. A. Morse, and K. P. Tradewell, both of Antigo.

EAU CLAIRE, WIS.—The Citizens Telephone Co. has been incorporated with $60,000 capital stock. The incorporators are David Drummond, R. V. Parkinson and R. R. Chase, all of this city.

PRENTICE, WIS.—The Prentice Mutual Telephone Co. has been incorporated with $5,000 capital stock. The incorporators are C. G. Nelson, J. A. Momer and J. W. Hicks, all of Prentice.

Construction.

OROFINO, IDAHO.—The Clearwater Telephone & Telegraph Co. will rebuild its line from this city to Kendrick, a distance of 35 miles. The ground wires will be replaced by a metallic circuit and new poles will be substituted for those now in use. Sampson Snyder is general manager of the company.

AKRON, IOWA.—The Farmers' & Merchants' Telephone Co. will erect a new exchange building in this city and also one at Westfield.

CHICAGO, ILL.—The Wabash Railroad has notified J. P. Church, superintendent of telegraph, to submit estimates upon the cost of installing telephones on the Springfield division and between Chicago and Montpelier.

VIRGINIA, ILL.—The Cass County Telephone Co. is planning to construct a new line between this city and Jacksonville, Ill.

GRAND RAPIDS, MICH.—The Citizens Telephone Co. is having plans prepared for the construction of a new branch exchange building in this city, to cost about $6,000.

KANSAS CITY, MO.—The Kansas City Home Telephone Co. is planning considerable improvements, among which is the erection of a new exchange building in this city.

STAPLEHURST, NEB.—The Staplehurst Telephone Co. has recently installed a new switchboard and will make considerable improvements to its system.

SHORTSVILLE, N. Y.—The Red Jacket Telephone Co. is planning to cable its wires in the village streets.

DRAYTON, N. D.—The Drayton Telephone Exchange is contemplating the installation of some cable.

MARION, S. D.—The Hurley Telephone Co. will make extensions to its system this summer.

Elections.

HARVARD, ILL.—At the annual meeting of the Harvard Telephone Co. the following officers were elected for the ensuing year: H. D. Crumb, president; Richard Phalen, vice-president; F. F. Axtell, secretary and treasurer. Mr. Axtell, the outgoing director, was re-elected, the other four members of the directorate being Mr. Crumb, Mr. Phalen, James Lake and J. C. Blake.

SOUTH BEND, IND.—At the annual meeting of the South Bend Home Telephone Co. the following directors were elected for the ensuing year: G. W. Harrison, C. L. McCormick, E. E. Daicey and H. G. Miller, all of South Bend, and S. F. Harris, Joseph Harris and Herman Kiper, of Chicago.

CASTANA, IOWA.—The Castana Mutual Telephone Co. held its annual meeting recently at which the following officers and directors were elected for the ensuing year: President, W. J. Donlin; vice-president, J. W. Nutt; secretary, W. H. Kennedy; treasurer, W. H. Waples, Jr.; manager, W. H. Rawlings; directors, M. F. Minthorn, P. T. Waples, W. W. Gingles and W. L. Wiley.

RISING SUN, MD.—At a meeting of the stockholders of the Cecil Farmers Telephone Co. the following officers were elected: R. K. Rowlings, of Woodlawn, president; Cecil E. Ewing, Rising Sun, vice-president; J. T. C. Hopkins, Port Deposit, secretary and treasurer.

GERING, NEB.—The annual meeting of the Cedar Valley Telephone Co. was held recently and the election of officers for the ensuing year resulted as follows: Mark L. Williams, president; Joseph Jones, secretary, and J. P. Douthet, treasurer. The trustees are F. E. McMullen, Lee Reeder and Harry McDonald, the latter newly elected.

BELLEFONTAINE, OHIO.—Directors of the United Telephone Co. have elected J. Q. A. Campbell president, and Harvey Allen, general manager.

CLEARFIELD, PA.—At a meeting of the stockholders, the Huntingdon & Clearfield, Telephone Co. was reorganized and the following officers were elected: A. W. Lee, Clearfield, president; John W. Wrigley, Clearfield, vice-president; Singleton Bell, Clearfield, secretary; H. J. Patton, Philadelphia, treasurer. The directors are as follows: A. W. Lee, Clearfield; John W. Wrigley, Clearfield; Singleton Bell, Clearfield; H. J. Patton, Philadelphia, and Rembrandt Peale, New York. Considerable improvements are contemplated and new exchanges wil be installed at Clearfield, Philipsburg and Madera at an early date.

PAWLET, VT.—At the annual meeting of the Rutland County Telephone Co. the following officers were elected for the ensuing year: A. W. Foote, of Middlebury, president and manager; H. E. Sanford, of Middlebury, treasurer, and D. S. Carpenter, of Middletown Springs, secretary.

OGDENSBURG, WIS.—The Ogdensburg Telephone Co. held its annual meeting recently and elected the following officials for the present year: President, U. G. Lytle; secretary, J. C. Johnson; treasurer, H. Johnson.

Financial.

CLARKSVILLE, ARK. The Johnson County Telephone Co. has amended its charter, increasing its capital stock from $15,000 to $50,000.

CERRO GORDO, ILL.—The Cerro Gordo Telephone Co. has increased its capital stock from $42,650 to $50,000.

WHITELAND, IND.—The Whiteland Telephone Co. has increased its capital stock $15,000.

WINCHESTER, IND.—The Farmers Telephone Co. has increased its capital stock $15,000.

HERMAN, NEB.—The Herman Telephone Co. has declared an annual dividend of $10 per share.

BARNSTEAD, N. H.—The Union Telephone Co. has been authorized by the Public Service Commission to issue $1,000 common stock for the purpose of making extensions to its system.

JOHNSTOWN, N. Y.—The Public Service Commission has authorized the Glen Telephone Co., with headquarters in this city, to issue $50,000 of the par value of its common capital stock, the proceeds to be used for improvements to its exchanges at St. Johnsville, Johnstown, Gloversville, Fonda, Canajoharie, Broadalbin and Fort Plain.

KENTON, OHIO.—The Kenton Telephone Co. has increased its capital stock from $150,000 to $175,000.

JEFFERSON, WIS. The Jefferson Mutual Telephone Co. has declared an annual dividend of 6 per cent.

Underground.

SPRINGFIELD, ILL.—The Central Union Telephone Co. will make considerable extensions to its underground system in this city, and in Canton and Peoria, Ill.

POUGHKEEPSIE, N. Y.—The New York Telephone Co. has been ordered to place its wires in underground conduit on several of the residence streets of this city.

COLUMBUS, O.—The Central Union Telephone Co. will make considerable extensions to its underground system in this city.

LORAIN, OHIO.—The Black River Telephone Co. is planning to spend $15,000 in underground construction work.

Miscellaneous.

COLFAX, CAL.—John B. McCleary has applied to the railroad commission for authority to sell the Colfax Suburban Telephone Co. to C. G. Bell and John Butler.

MT. VERNON, ILL.—The Talbott-Frost telephone lines from Mt. Vernon to Dix have been sold to J. G. Williamson, of Mt. Vernon.

POCAHANTAS, ILL.—Harry Delashmutt has sold the Pocahantas Telephone Co. to H. L. Dodson, of Martinsville. Mr. Delashmutt has purchased the Neoga Telephone & Telegraph Company at Neoga, Ill.

SAVANNAH, MO.—The Andrew County Mutual Telephone Co. has bought out the Bell exchange in this city.

WYMORE, NEB.—The stockholders in the Wymore Independent Telephone Co. have decided to dissolve the company and to refund money paid in on stock subscriptions.

FAIRLAND, OKLA.—The United Telephone Co., with headquarters in Afton, is rebuilding its entire system in Fairland. F. S. Miller, general manager of the company, is taking general charge of the work of reconstruction.

Classified Advertisements

Classified Advertisements in "TELEPHONY" cost 5 cents per word—minimum number of words per insertion, twenty. Cash should accompany order. Advertisements in black face type, 10 cents per word. No advertisements accepted after Thursday.

Equipment For Sale

"REBUILT" TELEPHONE APPARATUS and exchange equipment saves you 30 to 50 per cent without sacrificing quality or efficiency.

SWITCHBOARDS —Telephones—Apparatus — Protection Equipment—Cable—Everything you need for the installation and operation of a complete exchange—Magneto or Central Energy—of the best and most reputable manufacturers.

SIX YEARS SUCCESSFUL OPERATION of our "Rebuilt" Equipment Department puts it past the experimental stage. Quality and price will make you a permanent customer. Better investigate.

Ask for Our Free No. 78 Bargain Bulletin

Address
"Rebuilt" Equipment Department
PREMIER ELECTRIC COMPANY
CHICAGO, ILL.
"REBUILT" when connected with PREMIER means something

UNUSED TELEPHONES FOR SALE CHEAP—All parts are guaranteed—if not satisfied return to us. Prices and literature on request. Interstate Elec. & Mfg. Co., Sioux City, Iowa.

FOR SALE—Telephones bridging, three to four dollars each; telephones, series, one to three dollars each; Sterling terminals with cable attached 100 line go at $15 each. Everything sent out guaranteed. Phones without batteries one dollar, switchboard cable, generators, induction coils—everything telephony. Address: Telephone Sales Co., Oxford, Wis.

A PRINTOGRAPH FOR SALE; $75 takes it, with motor and type, complete. For circular letters, bills and office printing. Fine condition. Worth $250. TELEPHONY PUBLISHING CO.

Cable Testers

WET CABLE TROUBLE—If the wet spot can be located without cutting the cable the Wireless Cable Tester will do it. Sent on trial. Address, Electric Spec. Mfg. Co., 426 Granby St., Cedar Rapids, Iowa.

Cross Arms

CROSS ARMS manufactured from sound, straight grain Douglas fir. Send us specifications and get our prices before buying. Cameron Lumber Co., Ltd., Victoria, B. C. Can.

Directory Hangers

WE BEG TO DIRECT YOUR ATTENTION to the Universal Wire Loop, an improvement upon the ordinary string loop for hanging up catalogues, directories, telephone books, prices current, etc. Write us for prices and samples. Wire Loop Mfg. Co., 75 Shelby St., Detroit, Mich.

Expert

I AM A PATENT EXPERT. Consulting Engineer and Specialist in Electrical and Telephone Engineering. What is your problem? Francis W. Dunbar, Monadnock Block, Chicago, Ill.

INVENTIONS PERFECTED FOR MANUFACTURING, AND SALES NEGOTIATED BY TELEPHONE EXPERTS OF FIFTEEN YEARS' EXPERIENCE. FREE CONSULTATION. VAN DEVENTER & WARREN, SUMTER, S. C., SOLICITORS OF PATENTS. DEVELOPMENT ENGINEERS.

Help Wanted

WANTED—A telephone man to manage a telephone system of 250 telephones. Must invest a few hundred dollars. Address Telephone Sales Co., Oxford, Wis.

WANTED—High quality telephone factory has opening for first-class, reliable sales correspondent. Want a REAL BUSINESS GETTER. State experience and salary. All applications strictly confidential. Address 1478, care of TELEPHONY.

WANTED—Two telephone linemen wanted. Address Coon Bros., Rantoul, Ill.

WANTED—Traveling auditor. Must have experience in telephone accounting. Address Box 410, Aurora, Ill.

WANTED—Couple who can successfully handle exchange of about 125 subscribers; board and plant in good shape; good house; fuel and lights furnished; salary, $75 per month to right people; neither "Edisons nor experts" wanted; we want people who can and will work. Address: The Western Telephone Co., Big Springs, Texas.

FRANKEL TESTING CLIPS

No. 2521
The Standard Patented U. S. Nov. 15, 1904 and Foreign Countries.

The teeth grip the wire or binding post, the pin pierces the insulation of wire, making a perfect test connection.

Order today.

PRICES
Less than 12 20c
Doz. lots 12 12½c
100 lots 11c
500 lots 10c
1000 lots 9c

FRANKEL DISPLAY FIXTURE CO.
733-735 Broadway, New York

Loose Leaf Binders

FOR SALE—Loose Leaf Binders for telephone records as supplied to New York Telephone Company. Tell us your requirements. Buchan Sales Co., 314-320 Market St., Newark, N. J.

Plants For Sale

FOR SALE—Exchange in Oklahoma oil region; 30 miles rural lines; 94 telephones; undeveloped territory. Address W. G. S., care TELEPHONY.

FOR SALE—Telephone plant in Central Illinois. 400 subscribers; gross income nearly $7,000 per year; plant in good condition and price right. Located in good town of 2,000. For particulars write C. E. Schroeder, Altamont, Ill.

FOR SALE—A few good telephone plants, located in Indiana, with 300 to 600 subscribers. Address L. W. Conarroe, Kempton, Ind.

Poles

WE HAVE A LARGE STOCK of Western Red Cedar Poles, Northern White Cedar Poles, Butt Treated Poles. Get our prices. Page & Hill Co., Minneapolis, Minn.

Pole Changers

AN EFFICIENT POLE CHANGER makes good under all conditions—only $15 complete—why pay more? Order on 30 days' free trial or write, Current Electric Co., 18 E. Kinzie St., Chicago.

Positions Wanted

WANTED—Position as manager or wire chief by married man, experienced on Common Battery, Magneto plants and handling of employes. Please state salary. Address 1477, care TELEPHONY.

WANTED—Practical telephone man of ability is open for active management of medium sized plant. Substantial investment considered with first-class proposition. Address 1480, care TELEPHONY.

WANTED—Position as wire chief or manager and troubleman of a small exchange. Address 1481, care TELEPHONY.

Protective Apparatus

CABLE TROUBLE? Do away with it. Use MOON terminals —economical in installation and maintenance—highly satisfactory in service. Write for information. Moon Mfg. Co., 122 N. Jefferson St., Chicago.

Telephone Pay Station Signs

TELEPHONE PAY STATION SIGNS—Finest porcelain enamel. Practically indestructible. Retain true colors and finish. Get the ones with the reputation. Burdick Enamel Sign Co., 166 N. State St., Chicago, Ill.

Telephone Supplies

TELEPHONE SUPPLIES—Large and complete stock, prompt shipments and best discounts. Send for our catalogue Harry I. Wood Co., 514 W. Main St., Louisville, Ky.

WE ARE JOBBERS of electrical supplies. Our service and prices are unexcelled. Let us send you our catalog. Robinson-Nelson & Co., 711 E. Main St., Richmond, Va.

CONSTRUCTION SUPPLIES—Anything you need for your construction work can be ordered from us at prices that can't be beat. Doubleday-Hill Elec. Co., 721 Liberty Ave. Pittsburgh, Pa.

WE ARE JOBBERS. Get our prices on telephones, wires, pins, brackets, poles, cross arms, glass insulators—pole line hardware. Indianapolis Elec. Supply Co., Indianapolis, Ind.

"Buyers" Reference Index

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CHASE

Series of Special Model D Telephone Trucks, Capacity 1000 lbs. Price $1000.

Reduce Repair Costs

IDLE TIME is a big factor. Consider the *waste*, if it takes double or treble the time it should to get men and material to the job.

Consider a job five miles from the exchange. Every half-hour lost costs the time of a crew of men and a driver, in addition to the delay in completing the job.

Team and wagon methods are too slow—too high in cost. Replace them by Chase Motor Trucks. The men and material will be moved from job to job with dispatch.

Chase Trucks are simple, reliable, efficient. They have 167 less moving parts than other types. Actual service proves them sound.

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Six Efficient Models—Every Style of Body
Capacities 500 to 4000 lbs.

Chase Motor Truck Co.

412 E. Jefferson St. Syracuse, N. Y.

WANT TO SAVE MONEY?

Rebuilt apparatus looks like new—lasts as long and gives perfect service—it is guaranteed to give satisfaction

WHAT DO YOU NEED?

Ericsson all-steel, 3-bar, 1600-ohm Brdg. C. B. Type sets. Complete, less Batteries	35.50
Ericsson 3-bar, 1600-ohm Bridging Compacts. Complete, less Batteries	5.25
Cracraft-Leich Wall Type Automaphones. Complete, less Batteries	4.50
Cracraft-Leich Desk Type Automaphones. Complete, less Batteries	6.00
Cracraft-Leich 3-bar, 1600-ohm Bridging Compacts. Complete, less Batteries	5.35
Cracraft-Leich 3-bar, 1000-ohm Bridging Hotel Sets. Complete, less Batteries	3.50
Monarch 3-bar, 1000 or 1600-ohm Bridging Hotel Sets. Complete, less Batteries	3.75
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Monarch Local or C. B. Transmitters	.75
Dean Local or C. B. Transmitters	.75
Cracraft Local or C. B. Transmitters	.75
Ericsson Metal Cap Type Receivers	.50
Dean Concealed Cord Type Receivers	.75
Kellogg No. 28 Induction Coils	.30

Get our Bulletin for complete list

Rebuilt Telephone Equipment Co.

2127-2129 W. 21st Street
Chicago

"The returns from our Classified Advertisement surprised us."

. . . . . .

Was what an Eastern company said who recently used a TELEPHONY Classified Advertisement. The actual orders resulting from their advertisement exceeded the quantity of equipment offered for sale.

This shows that a more than ordinary responsiveness and alertness prevails among TELEPHONY subscribers; it shows too, that telephone companies *habitually* refer to the classified advertising columns.

. . . . . .

Whether you desire help—a position—an exchange; whatever the character of your wants or needs, try a TELEPHONY Classified Advertisement—*it's the solution.*

The Erection of Timber Preserving Plants—Creosoting or Kyanizing—is My Specialty.

I know all the problems entering into the building of such plants—have had wide experience on some large foreign installations. I can arrange plants for, Kyanizing with pressure in cylinder or without, open tank process, fluoric salts, etc.

References: Austrian and German Reichspost.

Ask for further information

Dr. Jng. Friedrich Moll

Südende bei Berlin. Brandenburgische, Strasse 4 (Germany)

Would you be content to use your present inadequate method if you knew you could do more, better and less expensive work with

ALLEN PRESTO SODER

Send 20c and your dealer's name for sample

L. B. Allen Co., Inc.

4578 N. Lincoln Street, Chicago, Ill.

CUTTERS SPECIALTIES

TEST CONNECTORS

The simplicity makes them cheap—the design is universally considered the best. Send for a sample and prices.

TREE INSULATORS

Improve your construction through wooded districts. Can be used after wire is strung without cutting. Get literature and prices from us.

SCOTT C. CUTTER - OSWEGO, ILL.

Delays Are Often Costly

Don't wait until that heavy storm comes and plays havoc with your lines, install Wirt Arresters on the Wirt Plan ***NOW,*** and be prepared.

Metallic Lightning Arrester Co.

Lewiston, Minn.

EUREKA Fibre Insulators and Terminal Blocks

The World's Best

STANDARD in all Correct Construction

EUREKA Insulated Nails are extensively employed by the leading Telephone Companies.

EUREKA Terminal Blocks are being generally adopted in railroad work.

Samples and particulars furnished promptly on request.

EUREKA SUPPLY CO., SEWELL, NEW JERSEY

Note Protection at Corners

Blake Insulated Staples

Unequalled for telephone and bell wiring. The fibre insulation prevents troublesome short circuits and grounds.

5 Sizes Pat. Nov., 1900

Write for Samples

Blake Signal & Mfg. Co.

BOSTON, MASS.

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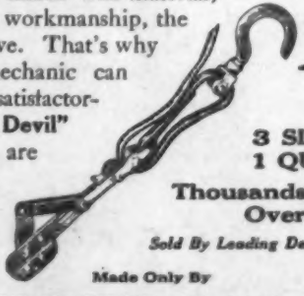

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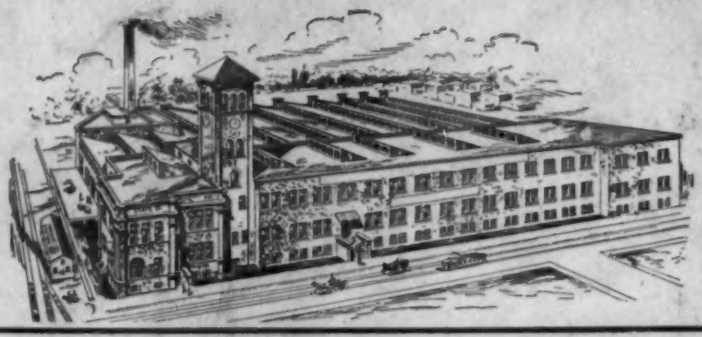

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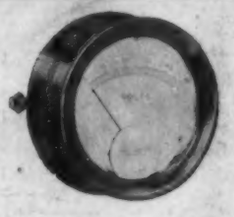

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